Effigies Authoris.

Arithmetick
Made Eaſie
For the Uſe and Benefit of
TRADES-MEN.
Wherein the
NATURE and USE of *FRACTIONS*,
both VULGAR and DECIMAL, are
TAUGHT by a New and Exact
METHOD.
ALSO
The Menſuration of SOLIDS and
SUPERFICIES.

The Sixteenth Edition, Corrected and Amended.

By *J. AYRES*, late *Writing-Maſter*,
in St. *Paul's* Church-Yard, *London*.

To which is Added, A Short and Eaſie
METHOD; after which Shop-keepers
may *State*, *Poſt*, and *Balance* their *Books* of
ACCOMPTS.
By *CHARLES SNELL*, Writing-Maſter,
and Accomptant, in *Foſter-Lane*, *London*.

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BRITISH MUSEUM

To the Right Honourable

Sir *William Aſhburſt*, Knt.

LORD-MAYOR

OF THE

City of *LONDON*,

This Manual of

Practical Arithmetick,

IS

HUMBLY DEDICATED
AND PRESENTED

BY

Your Lordſhip's
Moſt Obliged
Humble Servant,

JOHN AYRES.

The PREFACE.

THIS *Manual of* Practical Arithmetick, *adapted chiefly for the* Benefit *and* Uſe *of* Tradeſmen, *is the Product of ſome vacant Hours. A* Work *for its Nature and Kind* differing *from any Thing heretofore Publiſhed that I know of: All the* Rules *being made* plain *and* eaſie *to the* meaneſt Capacities, *for whoſe Sakes it is principally intended: Which is the Reaſon ſo much of the* Book *is taken up in* Explaining *and* Teaching *the* Ground-work, *viz.* Addition, Subtraction, Multiplication *and* Diviſion *which moſt Arithmetick Books are deficient in; a Defect in any of thoſe Rules will render the Labours of ſuch as learn Arithmetick by Books very difficult and hard. To help which, I have firſt of all laid down the* plaineſt way of Diviſion *for a Learner that wants the help of a Maſter, and afterwards have given the* ſhorteſt Italian way of Diviſion. *I have alſo omitted ſeveral Rules that are not of Uſe in Trade, ſuch as* Alligation, Barter, Loſs *and* Gain, Company with Time, *&c. And have ſupplied thoſe Omiſſions with what is more Uſeful and Practical,* viz. *Great Enlargements, and Variety of the Golden Rule of Three, the Rule of Three Inverſe, Double Rule of Three, and the Uſe of the Compound Rule of* Five Numbers *in working Intereſt, and the Nature of Exchange, Rules of Practice, with great Variety, and* ſhort ways *to caſt up* Merchandize. *The* Order *of* Deducting Tare *and* Ret, *with other Rules Uſeful in* Trade. *Laſtly, I have made* Fractions *very* eaſie *and* familiar, (*tho differing from any fromer* Method) *having mixed both* Vulgar *and* Decimal Fractions *together under the ſame Head, that the Ingenious may diſcover the* Eaſe *as well as* Excellency *and* Brevity *of the* Decimal *beyond the* Vulgar Fraction. *And as my* Paper *would admit, have added ſome* Variety *of* Meaſuring Superficies *and* Solids.

The Faults in the former Impreſſions, Care has been taken to correct in this *Sixteenth Edition.*

Arithmetick.

CHAP. I.

Of NUMERATION.

I. ARITHMETICK is the Art of Numbering well, or of Accompting well by Numbers: For as Magnitude or Greatneſs is the Subject of *Geometry*, ſo is Multitude or Number the Subject of *Arithmetick*.

II. The whole Art of *Arithmetick* depends upon the true Knowledge of the Five following Rules, *viz.* *Numeration*, *Addition*, *Subtraction*, *Multiplication* and *Diviſion*. All the other Rules being compounded of theſe, we ſhall treat particularly of them in their Order.

III. *NUMERATION Teaches to expreſs or write down the Value of any Number whatſoever propoſed.*

IV. All Numbers are written with Ten Characters called Figures, of which the laſt is called a Cypher, and of it ſelf ſignifieth Nothing, but ſerveth (according as it is placed) to increaſe or diminiſh the Value of another Figure to which it is either annexed or prefixed.

V. The Ten *Characters* or *Figures* by which all Numbers are expreſſed, are thus *written*, *viz.* 1. one; 2, two; 3, three; 4, four; 5, five; 6, ſix; 7, ſeven; 8, eight; 9, nine; 0, Cypher: The Nine firſt of theſe are called ſignificant Figures.

VI. All Numbers are either *Simple* or *Compound.*

1. A Number is ſaid to be *Simple*, when it conſiſteth but of *one Figure*, as, 4, 8, and 6, *&c.* are ſimple or ſingle Numbers.

2. A Number is ſaid to be a *Compound* Number, when it is compoſed of *two, three, four*, or *more Figures*, ſuch as are 35, 356, and 7428, *&c.*

VII. Every *ſignificant Figure* hath a double *Value*, *viz. Certain* or *Uncertain*.

1. The *value* of a Figure may be ſaid to be *certain*, when it ſignifies *ſimply* its *own* proper *Value*, without the Addition of any other Word for its Explanation, and ſo 4 ſignifieth *four*, 8 ſignifieth *eight*, and 9 is *nine*, &c.

2. The *value* of a Figure may be ſaid to be *uncertain*, in reſpect of the *place* it may ſtand in, and ſo 4 may ſignifie *forty*, or *four hundred*, or *four thouſand*, &c. and 8 may ſignifie *eighty*, or *eight hundred*, or *eight thouſand*, &c.

VIII. When a *Number* is compoſed of divers *Figures* ſet together like the Letters in a Word, that *Number* is ſaid to *conſiſt* of as many places as there are *Figures* uſed in the compoſing thereof. So the Number 4643 is ſaid to *conſiſt* of *four* places, becauſe it is compoſed of *four* Figures; the like is to be underſtood of any other.

IX. The *places* in every *Compound* Number are to be conſidered both as to their *Order*, and their *Value*.

1. The *order* of the *places* is from the *right-hand* to the *left*, the *firſt Figure* or *Cypher* towards the *right-hand* is ſaid to poſſeſs the firſt place, and the next towards the *left hand* is ſaid to poſſeſs the ſecond place, and the next to that the third place, *&c.*

So if this *Number* were propoſed, *viz.* 5734, here 4 is ſaid to poſſeſs the firſt, 3 the ſecond, 7 the third, and 5 the fourth place, *&c.*

2. The *value* of every *Figure*, is diſcovered by the place that it ſtands in, *viz.* The *firſt* place is

the place of *Units*, or ones; and the Figure that ſtandeth in that place ſignifieth its own proper or ſimple *Value*. The *ſecond* place is the place of *Tens*, and the Figure that ſtandeth there ſignifieth as many *Tens* as the Figure it ſelf containeth *Units*: As if it be 4, it ſignifieth four *Tens*, or forty; if it be 7, it ſignifieth ſeven *tens*, or ſeventy, *&c.* The *third* place of the place of *Hundreds*, and the Figure that ſtandeth there, is as many *Hundreds* as it containeth *Units*. So 5 in the *third* place is five *hundred*, and 6 ſignifieth ſix *hundred*, &c. The *fourth* place is the place of *Thouſands*, and the Figure that ſtandeth therein ſignifieth as many *Thouſands* as it contains *Units*, ſo 8 in the *fourth* place is eight *thouſand*, and 4 is four *thouſand*, *&c.* As,

Suppoſe this Number, *viz.* 4652. were given to have its *Value* expreſſed; the Figure 2, (in the *firſt* place) is two *Units*, or ſimply *two*; the Figure 5 (in the *ſecond* place) is five *Tens*, or fifty; ſo 52 is thus expreſſed, *viz. fifty two*: The Figure 6 (in the *third* place) is ſix hundred, ſo 652 is thus expreſſed, *viz. Six hundred fifty two*: the Figure 4 (in the *fourth* place) is *Four thouſand*, ſo 4652 is thus to be read, *viz. Four thouſand ſix hundred fifty two.*

In like manner if any Figure hath a *Cypher*, or *Cyphers* annexed to it, it ſhall ſtill retain the *value* of its place, as much as if a ſignificant Figure, or Figures, were annexed to it in the room of the *Cypher* or *Cyphers*; ſo if to the Figure 6 there be a *Cypher* annexed thus (60) its value is *ſix tens* or *ſixty*, becauſe it ſtandeth in the *ſecond* place, or place of *Tens*. Likewiſe if it have two *Cyphers* annexed to it thus (600) its value is *Six hundred*, becauſe it poſſeſſeth the *third* place or place of *Hundreds*. Alſo (6000) is *Six thouſand*, becauſe 6 ſtandeth in the *fourth* place, or place of *Thouſands*.

And the Value of any Figure increaſeth in a *Decuple* Proportion from the *Right* Hand to the *Left*, every place being *ten times* the Value of the former, as you may ſee in the following *TABLE*.

Numeration TABLE.

Hundreds of Millions	*Tens of Millions*	*Millions*	*Hundreds of Thouſands*	*Tens of Thouſands*	*Thouſands*	*Hundreds*	*Tens*	*Units*	*The Numbers in the TABLE are thus to be Read*, viz.
9	8	7	6	5	4	3	2	1	987 Mil. 654 Th. 321
1	2	3	4	5	6	7	8	9	123 Mil. 456 Th. 789
	2	3	4	5	6	7	8	9	-23 Mil. 456 Th. 789
		3	4	5	6	7	8	9	—3 Mil. 456 Th. 789
			4	5	6	7	8	9	————456 Th. 789
				5	6	7	8	9	————56 Th. 789
					6	7	8	9	————6 Th. 789
						7	8	9	————789
							8	9	————89
								9	————9

Over againſt every place of the Numbers in the foregoing Table is written (in words in length) the Value thereof; *viz. Units, Tens, Hundreds, Thouſands, &c.* which words being perfectly gotten by heart, and well underſtood, the Learner will be thereby enabled to expreſs or write down the Value of any Number propoſed.

And on the Right-hand of the Table, over-againſt every Number therein contained, you have Direction how to read or expreſs thoſe Numbers: As 987

987654321 is thus to be read, *viz. Nine hundred eighty ſeven Millions, Six hundred fifty four Thouſand, Three hundred twenty one.* And the like is to be unſtood of the reſt.

Note, Although the foregoing Table be made to conſiſt but of Nine Places, yet it may be continued to more Places at Pleaſure, even *ad infinitum*, obſervinging that the Value of every place is Ten times as much as that which goeth before it; ſo the tenth Place is *Thouſands of Millions*, the Eleventh place is *Tens of Thouſands of Millions*, the Twelfth place is *Hundreds of Thouſands of Millions*, and the thirteenth place is *Millions of Millions*, &c.

There is yet another Method uſed by ſome, that is very plain and uſeful in the expreſſing of great Numbers, or Numbers conſiſting of many Places, which is this, *viz.* make a point after every third Figure, beginning at the Right-hand, as in the following *Example*.

Let this Number be propoſed conſiſting of Fourteen places, *viz.* 84639042724536, and when every Third Figure is pointed, it will be thus, *viz.* 84. 639. 042. 724. 536. every Three Figures being called a Period, and are reckoned in order from the Right-hand towards the Left, *viz.* 536 is the firſt Period, 724 is the ſecond Period, 042 the third, &c. the firſt Period (which is 536) conſiſteth of *Units, Tens*, and *Hundreds*, and is thus expreſſed, *viz. Five Hundred Thirty Six*, and every other Period is to be read in every Reſpect as if it ſtood in the place of the firſt Period, only in expreſſing the Value of the ſecond Period, you muſt add thereto the word *Thouſand*; to the third Period you muſt add the word *Millions*; to the fourth Period the word *Thouſands*; to the fifth Period *Millions of Millions*; and ſo the Number before propoſed is to be read as followeth, *viz.*

Million

Millions of Millions	*Thouſands*	*Millions*	*Thouſands*	
84.	639.	042.	724.	536.

Eighty four *Millions of Millions*, Six hundred thirty nine *Thouſand*, forty two *Millions*, Seven hundred twenty four *Thouſand*, Five *Hundred* thirty ſix.

CHAP. II.

Of ADDITION.

ADDITION *Teacheth to add, or put together divers Numbers, and to bring them to one total Sum.* As if Seven and Nine were given to be added together, their Sum will be 16; and the Sum of 5 and 4 is 9.

II. *Numbers* to be added together, each of them *conſiſts* either of *one* Denomination, or of *divers*, as if it were required to add 16 *l.* to 14 *l.* here both the given *Numbers* are of one Denomination, being *Pounds* only, without Shillings, Pence, or Farthings: But if it were required to add 36 *l.* 14 *s.* 08 *d.* to 16 *l.* 12 *s.* 06 *d.* theſe conſiſt of *divers* Denominations, *viz.* of Pounds, Shillings and Pence.

III. When it is required to *add* together ſeveral *Numbers* of one *Denomination*, they muſt (in order to the Work) be diſpoſed of according to the following *Rule, viz.*

Place *the given Numbers one under the other in ſuch Order, that Units may ſtand under Units, Tens under Tens, Hundreds under Hundreds, Thouſands under Thouſands*, &c.

If you were to add 136 and 42 together, they muſt be placed one under the other as followeth, *viz.*

136 Or, 42
42 136

IV. Having placed the given Numbers as before is directed, then draw a ſtreight Line under them, and (beginning at the Place of *Units*) add all the Figures together that ſtand over one another in that *Rank*; putting their Sum under the ſaid ſtreight Line; as in this Example, I ſay, 2 and 6 is 8, wherefore I put 8 under the Line, and in its proper place, *viz.* under 2 and 6, and proceed to the next Rank, which is the place of Tens, ſaying, 4 and 3 is 7, wherefore I put 7 in its proper place under the Line; and proceed to the next and laſt Rank, where I find only 1, wherefore I put one in its proper place under the Line, and ſo the Work is finiſhed, and I find thereby that the Total Sum of 136 and 42 to be 178: See the Operation as followeth.

136 42
42 136
——— ———
178 178

V. If in adding together any of the Ranks (as is before directed) the Sum amounts to, or exceedeth 10, or any Number of Tens, then in ſuch Caſe you are either to ſet down a *Cypher* under the Line in its proper place, or elſe the *exceſs* above the *ten* or *tens*; and for every *ten* carry an *unit* to be added to the next Rank of Figures. As if it amount to 30, then ſet down (0) a Cypher, and carry 3 (for the three Tens) to be addded to the next Rank; if it amount to 34, then ſet down 4 under the Rank that you addd, and carry three to the next, *&c.* And when you have caſt up the laſt Rank or Series towards the Left-hand, ſet down the Total that it amounteth to, as in the following Examples.

	(1)	(2)	(3)	(4)
	748	4758	1648	20864
	364	6473	3472	78987
	296	2891	1865	6217
	242	1862	3479	4320
Sum	1650	15987	10464	110388

In the firſt of theſe Examples I begin, ſaying, 2 and 6 is 8, and 4 is 12, and 8 makes 20, which is juſt two Tens; wherefore I put down 0 under the Line, and carry 2 to the next Rank for the two tens, and proceed, ſaying, 2 that I carry and 4 is 6, and 9 is 15, and 6 is 21, and 4 is 25, which is 5 above 20, wherefore I put down 5 under the Line, and carry 2 for the two Tens to the next Rank, and then proceed, ſaying, 2 that I carry and 2 is 4, and 2 is 6, and 3 is 9, and 7 makes 16, wherefore (becauſe it is the laſt Rank) I put down 16 under the Line, and ſo the Work is finiſhed, the Total Sum of the *Addition* being 1650: The ſame is to be obſerved in the reſt of the Examples.

VI. *Addition of diverſe Denominations* cannot be well performed, untill you know the Value of common Coins, Weights and Meaſures, *&c.* As how many Pence make 1 Shilling, how many Shillings make 1 Pound, and how many Ounces make 1 Pound, how many Pounds make a Quarter of a C. and how many Quarters make a C. weight.

In Addition of Engliſh Money, It is neceſſary firſt of all to underſtand the Meaning and Signification of the Characters ſuperſcribed over every Sum, as *lib. s. d.*

Note, That *lib.* ſignifies Libra, a *Pound,* not here in reſpect to common Weight, but *Money,* and for Diſtinction is called a *Pound Sterling.* So *s.* ſtands for Solidus (a Coin of Braſs) uſed by the *Romans,* but with us of Silver, and ſignifies a *Shilling*; twenty of theſe Pieces make *One Pound Sterling.*

de. or *d.* ſtands for Denarius, a *Penny,* which contained Ten Pieces of the *Romans* leaſt Coin: It hath had a various Eſtimate in our *Engliſh Coins.* It now ſignifies a *Penny,* the 12th part of a Shilling, or 12 of which make a Shilling. For untill the Reign of *Henry* VI. a *Penny* was the 20th part of an Ounce of Silver, and in his Reign made the 30th. By *Edward* IV. 40 *Pence* made an Ounce. By *Henry* VIII. there was allowed 45 *d.* to the Ounce. And by Q. *Elizabeth* an Ounce of Silver was divided into 60 parts, called *Pence,* as it is at this Day.

ADDITION of MONEY.

Note, 4 *Farthings is a Penny,* 12 *Pence a Shilling, and* 20 *Shillings a Pound* Sterling, *or* Engliſh *Money.*

The following TABLE ought to be learn'd by heart.

			d.	s.	d.
12 times	1-is	12	20-is	1 :	8
	2	24	30	2 :	6
	3	36	40	3 :	4
	4	48	50	4 :	2
	5	60	60	5 :	0
	6	72	70	5 :	10
	7	84	80	6 :	8
	8	96	90	7 :	6
	9	108	100	8 :	4
	10	120	110	9 :	2
	11	132	120	10 :	0
	12	144			

VII. When it is required to add together *Numbers* conſiſting of *divers Denominations*, you are to place the given Numbers in ſuch order one under the other, that each Rank may conſiſt of one and the ſame Denomination. That is to ſay, if it be in Money: Let *Pounds* be ſet under *Pounds*, *Shillings* under *Shillings*, *Pence* under *Pence*, and *Farthings* under *Farthings*. The like is to be underſtood of *Weight*, *Meaſure*, *Time*, &c.

Then (having firſt drawn a Line a under them) add them together, conſidering how many of each ſmaller Denomination make an Unit of the next that is ſuperior to it, (always obſerving to begin at the leaſt Denomination) and for every ſuch Unit, carry 1 to the next ſuperior Denomination, *viz.* If it be in *Addition of Money*, for every 4 in the Farthings you muſt carry 1 to the Pence (becauſe 4 Farthings is a Penny;) (for every 12 in the Pence carry 1 to the Shillings (becauſe 12 Pence is a Shilling; and for every 20 contained in the Shillings, carry 1 to the Pounds (becauſe 20 Shillings is a Pound;) And the odd Farthings, Pence and Shillings, ſet down in their proper Ranks under the Line, as in the following Example.

Some do indeed make a place of *Farthings*, and ſet a *q.* over them for *quartillier*, which is not very proper, and ſeldom uſed by Men of Buſineſs; therefore when you would write down three *Farthings*, or a *Half-penny*, or a *Farthing*, write it thus:

$\frac{3}{4}$ ——— *Three Farthings.*
$\frac{1}{2}$ ——— *A Half-penny.*
$\frac{1}{4}$ ——— *A Farthing.*

Let it be required to add together 134 *l.* 16 *s.* 08 *d* $\frac{1}{4}$. and 286 *l.* 10 *s.* 4 *d.* $\frac{3}{4}$. and 498 *l.* 13 *s.* 06 *d.* $\frac{1}{2}$. and 794 *l.* 18 *s.* 09 *d* $\frac{1}{4}$. Then in order to the Work I ſet them down and draw a Line under them, as followeth.

l.		*s.*	:	*d.*
134	:	16	:	08 $\frac{1}{4}$
286	:	10	:	04 $\frac{3}{4}$
498	:	13	:	06 $\frac{1}{2}$
794	.	18	:	09 $\frac{1}{4}$

Firſt, I begin with the leaſt Denomination, which is that of Farthings, and add them together, ſaying, $\frac{1}{4}$ and $\frac{1}{2}$ is $\frac{3}{4}$, and $\frac{3}{4}$ is 6, and $\frac{1}{4}$ is 7 Farthings, which is 1 Penny and 3 Farthings, wherefore I put 3 Farthings under the Line, and under the Denomination of Farthings, and carry 1 (for the Penny) to the next Denomination of Pence, ſaying 1 that I carry and 9 is 10, and 6 is 16, and 4 is 20, and 8 is 28, now 28 Pence is 2 Shillings 4 Pence, wherefore I put 4 under the Line, and carry 2 Shillings to the Denomination of Shillings, ſaying, 2 that I carry and 18 is 20, and 13 is 33, and 10 is 43, and 16 is 59 Shillings, which is 2 Pounds 19 Shillings, whereof I put the 19 Shillings under the Line, and under the Denomination of Shillings, and carry 2 (for the 2 Pounds) to the Denomination of Pounds, and proceed, ſaying, 2 that I carry and 4 is 6, and 8 is 14, and 6 is 20, and 4 makes 24, wherefore I put down 4 under the Line, and carry 2 for the two Tens to the next Rank, ſaying, 2 that I carry and 9 is a 11, and 9 is 20, and 8 is 28, and 3 is 31, which is 1 above 30, wherefore I put 1 under the Line and carry 3 (for the three tens) to the next Rank, and proceed, ſaying, 3 that I carry and 7 is 10, and 4 is 14, and 2 is 16, and 1 is 17, wherefore I put 17 under the Line, becauſe it is the Sum of the laſt Rank, and ſo the whole Work is finiſhed, and I find the Sum of the given Numbers to be 1714 *l.* 19 *s.* 4 *d.* 03 *q.* as by the following Work appeareth.

	l.	*s.*	*d.*
	134 :	16 :	08 $\frac{1}{4}$
	286 :	10 :	04 $\frac{3}{4}$
	498 :	13 :	06 $\frac{1}{2}$
	794 :	18 :	09 $\frac{1}{4}$
Sum	1714 :	19 :	04 $\frac{3}{4}$

To prove your Addition, after you have added up your whole Sum, draw a Line with your Pen under the uppermoſt Number, or Sum, and then add together all the other Numbers, except the *uppermoſt* And when you have ſo done, add the Amount, or Sum thereof to the uppermoſt Sum above the Line; and if that Sum be equal to the Sum firſt found, the Work is true, otherwiſe not.

Here, *Note once for all*, That whatſoever Sums you are to add together, whether of *Money*, *Weight*, *Meaſure*, *Time*, &c. that when you come to the greateſt Denomination, as you caſt up the ſeveral Ranks thereof, you are to carry the Tens of every preceeding Rank to that which follows it, as is directed in the *Fifth Section* of this Chapter, and as the Ranks in the Denomination of Pounds in the laſt *Example* are caſt up.

The old common way of Addition of Money, is to make a *ſpeck* or *tittle* with your *Pen* at every 12 that is found in the *Addition* of your *Pence*; and ſo many *Specks* as you find, carry ſo many *Shillings* to the Place of Shillings, ſetting down what remains above 12 under the place of *Pence*. Then make a *ſpeck* at every 20 you find in the *Addition* of your *Shillings*, and for ſo many *Specks* carry ſo many *Pounds* to the place of Pounds, ſetting down the *Overplus* under the place of Shillings, and then proceed to add up the Pounds.

But the beſt Method, which I would commend to your Practice is this:

Firſt, Caſt up your Pence, or make a ſmall Comma at every 60 *d.* which is 5 *ſ.* (and it will be a great eaſe to the Memory (where Sums are long) and by the foregoing Table you may readily know, how many Shillings and Pence your Pence amount to; then ſet down your odd Pence under the place of Pence, and carry your Shillings to the Unit of Shillings, and add them up as in Addition of Numbers, by ſetting down the odd above the Tens, and carry the Tens to the Tens of Shillings, or Angels, (becauſe 10 *ſ.* is an Angel) then for every two in the place of Angels carry ſo many Pounds to the place of Pounds. An Example or two will make it plain and eaſie.

Example I.

A Shop-keeper looking over his Shop-Book, finds that A *owes him* 195 *l.* 11 *ſ.* 9 *d.* $\frac{1}{2}$. B 57 *l.* 14 *ſ.* 10 *d.* $\frac{1}{4}$. C 450 *l.* 10 *ſ.* 2 *d.* D 27 *l.* 16 *ſ.* 11 *d.* $\frac{3}{4}$. E 44 *l.* 13 *ſ.* 9 *d.* $\frac{1}{2}$. F 100 *l.* G 8 l. 14 *ſ.* 9 *d.* $\frac{1}{2}$. H 160 *l.* 10 *ſ.* 2 *d.* $\frac{1}{2}$. I 54 *l.* 11 *ſ.* 11 *d.* K 73 *l.* 9 *ſ.* 10 *d.* $\frac{1}{4}$.

In order to the Work, place the Sums one under the other, as is before directed, thus.

	l.		*ſ.*		*d.*
——*A*	195	:	11	:	9 $\frac{1}{2}$
——*B*	57	:	14	:	10 $\frac{1}{4}$
——C	450	:	10	:	2
——*D*	27	:	16	:	11 $\frac{3}{4}$
——*E*	44	:	13	:	9 $\frac{1}{2}$
——*F*	100	:	00	:	0
——G	8	:	14	:	9 $\frac{1}{2}$
——*H*	160	:	10	:	2 $\frac{1}{2}$
——*I*	54	:	11	:	11
——*K*	73	:	9	:	10 $\frac{1}{4}$
	1173	:	14	:	4 $\frac{1}{4}$

Then begin with the leaſt Denomination towards the Right-hand, which is Farthings, ſaying, 1 and 2 is 3, and 2 is 5, and 2 is 7, and 3 is 10, and 1 is 11, and 2 is 13 Farthings, which is 3 Pence $\frac{1}{4}$, wherefore put down $\frac{1}{4}$ under the Farthings, and carry 3 Pence to the place of Pence, and ſay, 3 and 10 is 13, and 11 is 24, and 2 is 26 and 9 is 35, and 9 is 44, and 11 is 55, and 2 is 57, and 10 is 67, and 9 is 76. Now by your Table 72 Pence is 6 *s.* therefore 76 is 6 *s.* 4 *d.* wherefore put down 4 *d.* under the place of Pence, and carry 6 *s.* to the place of Shillings, ſaying, 6 that you carry and 9 is 15, and 1 is 16, and 4 is 20, and 3 is 23, and 6 is 29, and 4 is 33, and 1 is 34, wherefore put down 4 under the place of Shillings, and carry *three Tens* to the place of *Tens of Shillings*, or *Angels*, and ſay, 3 that you carry and 1 is 4, and 1 is 5, and 1 is 6, and 1 is 7, and 1 is 8, and 1 is 9, and 1 is 10, and 1 is 11; now 11 Angels, or 11 ten Shillings is 5 *l.* 10 *s.* or 5 *l.* 1 Angel, therefore place 1 Angel under the Angels, and it makes the 4 to be 14 *s.* which place under the place of Shillings, and carry 5 Pound to the place of Pounds and finiſh the Work as before directed; and the Total Sum found will appear to be 1173 *l.* 14 *s.* 4 *d* $\frac{1}{4}$.

Example II.

A Banker on the Balance of his Books, finds himſelf indebted to L. 50 l. 10 s. 3 d. $\frac{1}{4}$. *to* M. 100 l. 10 s. 10 d. *to* N. 25 l. 7 s. 8 d. $\frac{3}{4}$. *to* O. 59 l. 17 s. *to* P. 507 l. 16 s. 10 d. $\frac{1}{2}$ *to* Q 7 l. 14 s. 9 d. $\frac{1}{4}$. *to* R. 37 s. *to* S. 25 s. 11 d. $\frac{1}{2}$. *to* T. 415 l. 10 s. 9 d. *to* V. 76 l. 13 s. 9 d. $\frac{1}{2}$. *to* W. 100 l. *to* X. 15 s. 11 d. $\frac{1}{2}$. *to* Y. 17 l. 17 s. *to* Z. 10 l. 00 s. 4 d. $\frac{1}{2}$.

l. *s.* *d.*

	l.		s.		d.
L ———	50	:	10	:	$3\frac{1}{4}$
M ———	100	:	10	:	10
N ———	25	:	7	:	$8\frac{3}{4}$
O ———	59	:	17	:	0
P ———	507	:	16	:	$10\frac{1}{2}$
Q ———	7	:	14	:	$9\frac{1}{4}$
R ———	1	:	17	:	0
S ———	1	:	5	:	$11\frac{1}{2}$
T ———	415	:	10	:	9
V ———	76	:	13	:	$9\frac{1}{2}$
W ———	100	:	00	:	0
X ———	00	:	15	:	$11\frac{1}{2}$
Y ———	17	:	17	:	0
Z ———	10	:	00	:	$4\frac{1}{2}$
Summ	1375	:	88	:	$3\frac{3}{4}$

Firſt of all add up your Farthings, as before directed, and they make 15, which is 3 d. $\frac{3}{4}$. place $\frac{3}{4}$ under the Farthings, and carry 3 Pence to the Pence, and ſay, 3 and 4 is 7, and 11 is 18, and 9 is 27, and 9 is 36, and 11 is 47, and 9 is 56, and 10 is *66, at which* 10 *make a Comma*, becauſe *66 d.* is 5 s. 6 d. then proceed and carry 6 d. to the next Figure, which is 8, and ſay 6 and 8 is 14, and 10 is 24, and 3 is 27. Now 27 d. is 2 s. 3 d. and the 5 s. before, makes 7 s. 3 d. wherefore ſet down the 3 Pence under the place of Pence, and carry 7 Shillings to the place of Shillings, and proceed to finiſh your Summ as was taught you in the laſt Precedent, and the Total Sum will appear to be 1375 l. 18 s. 3 d. $\frac{3}{4}$.

Addition

Addition of Averdupois *Weight*.

Note, *That* 16 *Drams is an Ounce*, 16 *Ounces, is a Pound*, 28 *Pound is a Quarter of an Hundred*, 4 *Quarters is an Hundred Weight, conſiſting of* 112 *Pounds, and* 20 *Hundred is a Tun* Averdupois *Weight*.

The Marks or Characters by which this Weight is known or expreſſed are theſe, *viz. For Tuns* (*T.*) *Hundreds* (C.) *Quarters* (*Qr.*) *Pounds* (℔.) *Ounces* (*oz.*) *Drams* (*dr.*) As in the following Example.

Tun	C.	*q.*	℔		C.	*qr.*	℔	*oz.*
25	14	2	24.		154	1	19	10
57	16	3	25.		275	3	19	11
42	10	1	17		476	2	10	07
96	14	2	27.		57	3	14	08
54	17	2	18.		45	1	10	10
59	16	3	22.		17	2	22	11
75	14	2	19.		45	3	17	09
64	17	3	26		76	2	19	14
478	04	0	10		1150	2	01	00

Let it be required to add up the Sum above, expreſſing *Tuns*. C. *qr.* and ℔. Firſt, add up the Pounds by making a Speck or Tittle at every 28 you find in the place of Pounds, as you may ſee in the above-mentioned *Example*, where is found to be ſix Specks, and 10 ℔ over, which 10 place under the Denomination of Pounds, and carry 6 to the Quarters, and add them up, they make 24, which is 6 C. for which put a (o) under the place of *qrs.* and carry 6 C. to the place of C. Then proceed to add up your C. after the ſame manner as you carry from Shillings to Pounds, becauſe 20 C. make a *Tun*.

Laſtly, Add up the *Tuns*, and the Total will appear to be 478 *Tun.* 04 C. 0 *qr.* 10 ℔.

With *Troy-weight* are weighted Bread, Gold, Silver, and Electuaries. And with *Averdupois-Weight* are weighed Butter, Cheeſe, Fleſh, Wax, Tallow, Pitch, Rozen, Lead, Iron, all ſorts of Grocery Wares, and all ſuch kind of Garble whence there may iſſue a Waſte.

The Pound *Averdupois*, containing 16 Ounces, is equal to 14 *oz.* 12 *pw. Troy-weight*. And the Pound *Troy-weight*, conſiſting of 12 Ounces, is about 13 Ounces, 2 Drams and a half of *Averdupois-weight*; ſo that he who tells you a Pound a Bread is as heavy as a Pound of Cheeſe, is very much miſtaken, the one being a Pound *Troy*, and the other a Pound *Averdupois-weight*.

WOOL is alſo weighed with *Averdupois-weight*, but the Diviſions are ſomewhat different, *viz.* for Wool,

7 Pounds is a Clove, 2 Cloves is a Stone, 2 Stone is a Todd, 6 Todds 1 Stone, 12 Stone is a Wey, 2 Weys is a Sack, 12 Sacks is a Laſt of Wool.

Note, That according to the foregoing Diviſion 182 ℔ is a *Wey*, but in ſome Countries the *Wey* is 256 ℔ *Averdupois*, as in *Suffolk*, &c. And in *Eſſex* there is 336 ℔ in a *Wey*.

Addition of Apothecaries *Weights*.

Apothecaries Weights are the ſame in the main with *Troy-weight*, only the Subdiviſions of the Pound are different, as followeth, *viz.*

Note, *That 20 Grains is a Scruple, 3 Scruples is a Dram, 8 Drams is an Ounce, and 12 Ounces is a Pound Weight.* The Marks or Characters by which Apothecaries Weights are known, are theſe, *viz. For Pounds* (℔) *Ounces* (℥) *Drams* (ʒ) *Scruples* (℈) *and Grains* (*gr.*)

℔.	℥.	ʒ.	℈.	gr.
76	00	2	0	15
54	10	5	2	17
68	11	7	1	12
28	04	4	1	14
16	10	0	2	18
35	06	1	0	14
281	04	6	1	09

Addition of Troy-*Weight.*

Note, *That 24 Grains is a Penny-weight, 20 Penny-weight is an Ounce, and 12 Ounces is a Pound Troy-weight.*

The Notes or Characters by which *Troy-weight* is known, are theſe, *viz.* The Mark of Pounds is (℔.) of Ounces (*oz.*) of Penny-weights (*pw.*) of Grains (*gr.*)

Let it be required to add the following Particulars together, *viz.* 24 ℔. 09 *oz.* 06 *pw.* 11 *gr.* and 164 ℔. 10 *oz.* 14 *pw.* 18 *gr.* and 82 ℔. 7 *oz.* 17 *pw.* 20 *gr.* and 8 ℔. 11 *oz.* 18 *pw.* 22 *gr.*

Now, in order to find out the Sum of theſe given Quantities, I place them one under another orderly, s you ſee in the Margent, and draw a Line under hem Then I begin with he Denomination of Grains, aking a Prick with the Pen, t every 24 (for eaſe) and bear he overplus to the next above, ſaying, 22 and 20 is 42 hich is 18 above 24, wherefore I make a Mark at 20, and arry the 18 up higher, ſaying 18 and 18 is 36, which is 2 above 24, wherefore I make a Mark at 18, and arry the 12 to the next above, ſaying, 12 and 11 ake 23, which I put under the Line in its proper lace, and obſerve how many Pricks I have made in e caſting up this Denomination, which I find to e 2, wherefore I carry 2 to the next, and proceed s in the Shillings in *Addition of Money*, becauſe I rry 1 for every 20) ſaying, 2 and 8 is 10, and 7 17, and 4 is 21, and 6 is 27, and (then down again ith the Tens) 10 is 37, and 10 is 47, and 10 is 57 enny-weights; which is 2 *oz.* 17 *pw.* wherefore I ut 17 *pw.* in its place under the Line, and carry e 2 *oz.* ſaying, 2 that I carry and 1 is 3, and 7 is 10, d 9 is 19, and 10 is 29, and 10 is 39 Ounces, hich is 3 ℔. 3 *oz.* wherefore I put the 3 Ounces its proper place under the Line, and carry the ℔. to the Pounds and proceed to finiſh the Work is before directed, which being done, I find the tal Sum to be 281 ℔. 3 *oz.* 17 *pw.* 23 *gr.* as in e Margent.

℔.	*oz.*	*pw.*	*gr.*
24	09	06	11
164	10	14	00.
82	07	17	20.
8	11	18	22.
281	03	17	23.

More Examples for Practice.

℔.	*oz.*	*pw.*	*gr.*	℔.	*oz.*	*pw.*	*gr.*
379	05	14	18.	297	10	07	13.
168	11	17	14	768	09	14	06
794	09	10	22.	635	11	18	21.
634	10	18	20.	74	08	18	19.
75	06	11	15.	35	10	14	14.
34	00	06	16	24	06	16	18
2087	09	09	09	1837	10	10	19.

Addition of Liquid Meaſure.

The leaſt Denomination in *Liquid Meaſure* is a Pint, which was heretofore deduced from a Pound *Troy Weight*, a Pound of Wheat *Troy Weight* making a Pint *Liquid Meaſure*, but in regard of the Diſagreement thereof with the Rules of Solid Geometry in the gauging of Brewers Veſſels, ſome taking 288 ſolid Inches for a Gallon, ſome 286, *&c.* it occaſioned a Difference between the Brewers and the Managers of his Majeſties *Exciſe*, 'till the Parliament taking the Matter into Conſideration, ordained, That 282 ſolid Inches ſhould make the Gallon of *Beer Meaſure*, and the Gallons being ſubdivided into 2 Pottles, each Pottle into 2 Quarts, and each Quart into 2 Pints, ſo that the Pint being the *Engliſh* Part of a Gallon, muſt contain 28 ſolid Inches and 7 eighth parts of an Inch for *Wine Meaſure*, and 35 ſolid Inches and a quarter for *Beer Meaſure. Wherefore* Note, *That* 35 ¼ *ſolid Inches make a Pint of* Beer-Meaſure, 2 *Pints is a Quart, and* 2 *Quarts is a Pottle,* 2 *Pottles or* 282 *ſolid Inches a Gallon,* 8 *Gallons is a Firkin of Ale,* 9 *Gallons is a Firkin of Beer, and* 2 *Firkins is a Kilderkin, and* 2 *Kilderkins is a Barrel,* 1 ½ *Barrel, or* 54 *Gallons is a Hogſhead of Beer.*

In

In Wine *Meaſures.*

2 Pints is a Quart, 2 Quarts is a Pottle, 2 Pottles is Gallon, 42 Gallons is a Teirce, or Third part of a Pipe or Butt, 63 Gallons is a Hogſhead, 2 Hogſheads is a Pipe or Butt, and 2 Pipes or Buts is a Tun of Wine.

☞ *Note,* Honey and Oil are meaſured by this Meaſure.

Examples of Wine *Meaſure.*

T.	*hhds.*	*gal.*	*pts.*	*T.*	*hhds.*	*gal.*	*pts.*
37	3	18	5	240	1	48	3
48	2	24	0	196	3	22	1
67	1	20	6	97	3	51	5
38	2	17	7	85	2	17	6
79	0	47	3	43	0	25	0
64	1	52	4	93	1	38	5
355	3	55	1	757	1	14	4

Addition of Dry *Meaſure.*

The leaſt Denominative part of *Dry* Meaſure is a Pint, which is taken from *Troy-weight.*

With theſe are meaſured all dry Subſtances, as, *Corn, Salt, Coal, Sand,* &c. The Table followeth.

In Dry Meaſure, Note, *That 2 Pints make a Quart, 2 Quarts a Pottle, 2 Pottles a Gallon, 2 Gallons a Peck, 4 Pecks a Buſhel* Land-Meaſure, 5 *Pecks a Buſhel* Water-Meaſure, 8 *Buſhels a Quarter,* 4 *Quarters a Chalder, and* 5 *Quarters a Wey.*

Note, 36 *Buſhels is a Chaldron of Sea-Coal in* London.

Examples of Dry *Meaſure.*

Chald.	*qrs.*	*Buſh.*	*pec.*	*Chalds.*	*qrs.*	*Buſh.*	*pec*
148	3	6	3	227	1	5	0
375	1	7	2	742	3	7	1
296	2	4	3	148	2	4	1
128	1	5	0	97	2	6	3
94	0	5	2	48	0	3	0
38	2	4	3	62	3	1	1
1082	1	2	1	1327	2	3	2

Addition of Long *Meaſure.*

Long Meaſure is originally deduced from a Barley Corn taken out of the middle of the Ear and well dried, from whence is deduced the following Table, *viz.*

In Long Meaſure, Note, That 3 *Barley-Corns make an Inch,* 12 *Inches a Foot,* 3 *Foot a Yard,* 3 *Foot* 9 *Inches, or a Yard and a Quarter, is an Ell* Engliſh, 6 *Feet a Fathom,* 5 *Yards and an half, or* 16 *Feet and an half, make one Statute Pole, or Perch,* 30 *Poles or Perches make a Furlong, and* 8 *Furlongs make an* Engliſh *Mile.*

Examples of Long *Meaſure.*

Miles	*Fur.*	*Perch.*	*Miles.*	*Fur.*	*Perch.*
48	7	24	134	3	18
37	3	18	342	4	24
65	3	28	179	5	16
36	5	00	84	0	25
107	1	07	76	7	27
205	6	17	84	2	13
501	6	04	902	1	03

Addition of Cloth *Meaſure.*

Note, *That 4 Nails or 9 Inches make a quarter of a Yard, 3 quarters of a Yard make an Ell* Flemiſh, *4 quarters a Yard* Engliſh, *5 quarters of a Yard, or 45 Inches is an Ell* Engliſh.

Examples of Cloth *Meaſure.*

Yds.	*qu.*	*na.*	*Ells*	*qrs.*	*na.*	*Ells fl.*	*qrs.*	*na.*
137	3	3	376	2	0	184	1	2
295	1	2	378	3	3	357	2	1
112	2	3	742	3	1	475	2	2
215	0	1	97	2	2	251	1	0
174	1	2	84	1	2	164	0	2
764	3	0	68	0	3	87	1	3
1700	0	3	1547	3	3	1521	0	2

Addition of Land *Meaſure.*

From the foregoing Table of Long Meaſure, is alſo Superficial Meaſure deduced, that of Land Meaſure being as follows, *viz.*

In Land Meaſure, 40 Square Poles or Perches make a Rood, and 4 Roods make an Acre.

Examples of Land *Meaſure.*

Acr.	*Rood.*	*Per.*	*Acr.*	*Rood.*	*Per.*	*Acr.*	*Rood.*	*Per.*
120	2	34	164	1	20	320	3	10
275	3	14	130	3	25	180	1	19
162	1	35	644	2	17	672	3	28
98	2	20	563	0	24	191	0	12
47	3	30	372	3	18	634	1	15
64	1	15	140	1	26	87	2	14
769	3	28	2016	1	10	2087	0	18

Of TIME.

The Denominative Parts of Time are originally deduced from the Sun's Motion in the Heavens, which is carried round the ſame from *Eaſt* to *Weſt* by the rapid Motion of the *Primum Mobile* in one Day Natural, which Day is divided into 24 ſuppoſed equal Parts, called Hours, and each Hour is ſubdivided into 60 Minutes, *&c.* whence ariſeth the following Table, *viz.*

In *Time,* Note, That 60 *Minutes make an Hour,* 24 *Hours make a Natural Day,* 7 *Days make a Week,* 4 *Weeks make a Month, conſiſting of* 28 *Days,* 13 *Months* 1 *Day and* 6 *Hours make a Year.*

However, in the ordinary Computation of Time, the Year is divided into 12 unequal Kalendar Months, whoſe Names, and the Numbers of Days that each containeth, are as ſolloweth, *viz.*

	Days		Days
January	31	*July*	31
February	28	*Auguſt*	31
March	31	*September*	30
April	30	*October*	31
May	31	*November*	30
June	30	*December*	31

Note, That the 6 odd Hours is reckoned but once in 4 Years, and the one whole Day is added to that Year making it to conſiſt of 366 Days, and is called *Leap-Year* ; the ſaid Day is added to *February*, which then containeth 29 Days.

Note alſo, *That the Minute is uſually ſubdivided into* 60 *Seconds*, *and each Second into* 60 *Thirds*, &c.

The Tropical Year, or the time the Sun leaves the Tropick, 'till the Time it returns to it again, by the Obſervations of the moſt Accurate Aſtronomers, is found to conſiſt of 36 *Days*, 5 *Hours*, 49 *Minutes*, 4 *Seconds*, and 21 *Thirds*.

CHAP. III.

Of SUBTRACTION.

I. SUBTRACTION *Teacheth to take a leſſer Number from a greater, or an equal from an equal; whereby we diſcover the* Remainder, Exceſs, *or* Difference.

II. *In Subtraction*, if the Numbers given be Integers, that is, conſiſting of one Denomination, then place the biggeſt Number uppermoſt, and the leſſer in order under it, *viz.* Units under Units, Tens under Tens, Hundreds under Hundreds, *&c.* And draw a Line under them.

III. Then begin at the Place of Units, taking the lowermoſt Figure out of the uppermoſt, and place the Remainder under the Line, then proceed to the place of Tens, and do in the ſame manner, and then to the place of Hundreds, *&c.* 'till the whole Work be finiſh'd : Then ſhall the Number under the ſaid Line be the Remainder or Difference.

Example.

Let it be required to find the Difference between 48 *and* 16 *?*

Firſt, I put down the biggeſt Number, 48, and place *16* the leſſer Number under it, and under both I draw a Line, as you ſee in the Margent; then I begin at the place of Units, ſaying, 6 out of 8 and there remains 2, which I place under the Line, and proceed to the next place, ſaying, 1 from 4 and there remains 3, which I likewiſe place under the Line, and the Work is finiſhed. So that I find the Remainder or Difference between 48 and 16, to be 32, as you may ſee by the Work in the Margent.

48
16
—
32

More Examples of the like Nature follow.

From	743	586	3785	1842
Subtr.	121	270	205	342
Remains	622	316	3580	1500

But if the particular Figure which you are to *Subtract*, be greater than the Figure out of which it is to be *Subtracted*; then you are to borrow 10, and add it to the uppermoſt Figure, and then *Subtract* the ſaid lowermoſt Figure, from their Summ, and place the *Remainder* underneath the Line, and for that which you borrowed, add 1 to the next Figure in the lowermoſt Line, and proceed. Let this be repeated as often as there is occaſion.

Example.

Let it be required to Subtract 3872 *from* 43758.

The given Numbers being placed, and a Line drawn under them, as is before directed, I begin at the Right hand, ſaying, 2 from 8, and there remains 6, which I ſet under the Line, and proceed, ſaying, 7 from 5 I cannot, but 7 from 15 and there remains 8, which I put under the Line, and proceed to the next, ſaying, 1 that I borrow'd and 8 is 9 from 7 I cannot, but 9 from 17 and there remains 8, which I put under the Line, and proceed to the next Figure, ſaying, 1 that I borrow'd and 3 is 4, from 3 I cannot, but 4 from 13 and there remains 9, which I put under the Line; now, becauſe there is no Figure ſtanding under the 4, I therefore ſuppoſe, a (o) Cypher to be placed there, and becauſe I borrowed 1 at the laſt Figure, therefore I pay it here by ſubtracting it out of the 4, ſaying, 1 that I borrowed out of 4 and there remains 3, which I put under the Line, and the Work is finiſhed; and I find (after the Work of Subtraction is ended) the Remainder to be 39886. Theſe Examples being well underſtood, will render what follows to be plain and eaſie.

43758
3872
39886

From	7458	50876	10008576
Subtr.	467	947	8743
Remains	6991	49929	9997933
From	5100	30210	15764
Take	1754	10325	7276
Reſt	3346	19885	8488
Proof	5100	30210	15764

The Proof of Subtraction.

For Proof of *Subtraction*, add the reſt, or Remainder, to the Number Subtracted, and if the Sum be equal to the uppermoſt Number, (*being the Number from whence Subtraction is made*) your Work is true, otherwiſe falſe, as you may ſee in the laſt Example of Subtraction above-mentioned.

Subtraction of Money.

IV. If the given Number conſiſts of divers Denominations, ſuch as *Money*, *Weight*, *Meaſure*, *Time*, &c. then you are to place the leſſer Number under the greater in ſuch ſort, that each Denomination may ſtand under its correſpondent Name, as has been directed in *Addition*, and draw a Line under them.

Then proceed to ſubtract the undermoſt from the uppermoſt, beginning at the leaſt Denomination, and proceeding gradually towards the Left-hand, ſetting the *Remainder* of each Denomination under the Line, until the whole be finiſhed: as for Example.

Let it be required to ſubtract 129 *l.* 07 *s.* 04 *d* $\frac{1}{4}$ from 250 *l.* 13 *s.* 10 *d.* $\frac{3}{4}$. Firſt I place them down, the leſſer under the greater, and draw a Line under them, as you ſee in the Margent.

Then I begin at the Right-hand, ſaying, 1 Farthing from 3 Farthings, and there remains 2, which I put under the Line in the place of Farthings, and proceed to the Denomination of Pence, ſaying, 4 from 10 and there remains 6, which I put under the Line in the place of Pence, and then I go to the Denomination of Shillings, ſaying, 7 from 13, and there reſt 6, which I put under the Line in the place of Shillings, and then I proceed to finiſh the Work according to the third Rule of this Chapter ; which being ended, I find the Remainder to be 121 *l.* 06 *s.* 06 *d.* $\frac{1}{2}$. as you ſee in the Margent.

V. But if the lowermoſt Number in any of the Denominations chance to be greater than the uppermoſt, you muſt in ſuch caſe borrow an Unit from the next greater Denomination, ſubtracting the lowermoſt Number therefrom, and *adding the Remainder* to the ſaid uppermoſt Number, and place that Sum under the Line ; and then proceed, adding one to the next lowermoſt Number to the Left-hand for that you borrowed, *&c.*

A few *Examples* will make this Rule very plain.

l.	*s.*	*d.*
348	11	07 $\frac{3}{4}$
178	15	09 $\frac{1}{4}$
109	16	10 $\frac{1}{2}$

Let it be required to ſubtract 178 *l.* 15 *s.* 9 *d.* $\frac{1}{4}$. from 348 *l.* 12 *s.* 7 *d.* $\frac{3}{4}$. Firſt, I place them down in order, as has been before directed, and draw a Line under them. Then I begin at the Right-hand with the Denomination of Farthings ; ſaying 1 from 3 and there remains 2, which I put under he Line, and proceed to the Denomination of Pence, aying, 9 Pence out of 7 Pence I cannot, but (borowing one from the next Denomination, which is hillings, and makes 12 Pence, I ſay, 9 from 12 and here remains 3, which I add to the 7 Pence and hat makes 10 Pence, wherefore I put 10 Pence unler the Line, and proceed to the next Denomination, hich is Shillings, and ſay, 1 that I borrowed, and 5 is 16 from 12 I cannot, but (borrowing 1 Pound rom the next Denomination, which is 20 Shillings) 6 from 20 and there remains 4, which added to the aid 12 makes 16 Shillings, which I ſet down under he Line, and proceed to the Pounds, ſaying, 1 that borrowed and 8 is 9 from 8 I cannot, but 9 from 8, *&c.* And the Work being finiſhed, I find the Remainder to be 109 *l.* 16 *s.* 10 *d.* $\frac{1}{2}$. as appears by he Work in the Margent.

Example

Examples for Practice.

	l.	s.	d.	f.	l.	s.	d.	f.
Received	295	11	03	¼	425	00	05	½
Paid	107	14	09	½	107	11	08	¼
Reſt	178	16	05	¾	307	08	08	¾
Proof	295	11	03	½	415	00	05	½
Debtor	100	00	00		1072	01	05	
Creditor	75	00	09		107	16	10	½
Ballance	24	19	03		964	04	06	½
Proof	100	00	00		1072	01	05	
Received	1010	10	10		100	00	09	½
Disburſt	942	13	11	½	47	00	10	
Reſt	67	16	10	½	52	19	11	½
Proof	1010	10	10		100	00	09	½

VI. If a Summ be lent, and Payment thereof made a ſeveral times in part, and you would know how much remains due, in this caſe you muſt add the ſeveral payments into one Summ, and ſubtract that Summ from the Summ lent, and the Remainder will ſhew how much is due. An Example or Two will make it plain and eaſie.

Lent

	l.	*s.*	*d.*	*l.*	*s.*	*d.*
Lent	3475	10	05	572	11	05
Paid at ſeveral times	358	14	07 ½	154	09	07 ¼
	524	07	11 ¾	95	10	07
	294	16	09	6	14	05 ½
	344	10	08 ½	72	11	04
	365	15	10 ¼	16	17	02
	795	15	07 ¼	9	14	11 ½
	462	14	08	164	17	09
Paid in all	3136	16	02 ¼	520	15	10 ¼
Reſts due	338	14	02 ¾	51	15	06
Proof	3475	10	05	572	11	05

Examples.

	l.	*s.*	*d.*
Lent	4768	17	10 ¼
Received at ſeveral Times	347	14	06 ½
	785	11	11 ¼
	128	15	09 ¼
	420	16	05
	124	00	02 ¾
Received in all	1806	18	11 ¼
Remains due	2961	18	11

	l.	*s.*	*d.*	*l.*	*s.*	*d.*
Borrowed	3475	10	05	4620	00	00
Paid at ſeveral times	358	14	07 ½	409	09	10
	514	07	11 ¾	276	15	07 ¼
	294	16	09	195	13	11 ¾
	344	10	08 ⅐	167	19	12 ½
	365	15	11 ¼	984	19	05 ¼
	792	05	06 ½	785	07	06
Paid in all	2670	11	05 ½	2820	03	02 ¾
Reſts due	804	18	11 ½	1799	16	09 ¼
Proof	3475	10	05	4620	00	00

Let us prove the *Example* of the Fifth Rule in Subtraction of Money, where it is required to Subtract 178 *l.* 15 *s.* 9 *d.* ¼. from 348 *l.* 12 *s.* 7 *d.* ¾.

	l.	*s.*	*d.*
From	348	12	07 ¾
Subtr.	178	15	09 ¼
Remain	169	16	10 ½
Proof	348	12	07 ¾

In this *Example* the Remainder is found to be 169 *l.* 16 *s.* 10 *d.* ½, which I add to 178 *l.* 15 *s.* 9 *d* ¼. (the Number given to be ſubtracted) and the Sum is 348 *l.* 12 *s.* 7 *d.* ¾. which is equal to the uppermoſt of the given Numbers, wherefore I conclude the Subtraction to be truly wrought.

Subtraction of Averdupois *Weight.*

A Salter buys 45 Tun 7 C. 1 qr. 22 ℔. *of Logwood, of which he ſold* 19 Tun 14 C. 1 qr. 18. ℔.

In order to the Work, I diſpoſe of the given Numbers according to the Directions of the Fourth Rule of this Chapter, drawing a Line under them, s you ſee in the Example.

Tun	C.	q.	℔.
45 :	07 :	1 :	12
19 :	14 :	1 :	18
25 :	12 :	3 :	22

Then I begin at the right Hand, which is Pound veights, ſaying, 18 out of 12 I cannot, but 18 out f 28 (borrowing a *qr.* of a C. *(which is* 28 ℔,) nd there remains 10, to which add the 12 ℔, it nakes 22 ℔, which I place under the ℔, and carry to the Quarters, and ſay, 1 that I borrowed and 1 s 2, now 2 Quarters out of 1 I cannot, but 2 out Quarters, *which is a* C. *weight)* there remains 2, to vhich add the 1 Quarter, it makes 3, which I place nder the *Qrs.* and proceed to the C. and ſay, 1 that borrowed and 14 C. is 15 C. now 15 C. out of 7 C. cannot, but 15 C. out of 20 C. *(which is* 1 *Tun)* here remains 5, to which add the 7 C. it makes 2 C. which I place under the C. and proceed to the uns, and ſay, 1 that I carried and 9 is 10, 10 out I cannot, but 10 out of 15, reſt 5, and carry 1, nd ſay, 1 that I carry and 1 is 2, 2 out of 4 and here remains 2, and the Work is finiſh'd, and I find he *Remainder* or *Difference* to be 25 *Tun,* 12 C. 3 *Qrs.* 22 ℔.

More Examples for the Learners to Practice.

	Tun.	C.	qr.	℔.	C.	qr.	℔.
Bought	107	10	2	05	74	0	15
Sold	94	17	3	10	19	1	11
Reſt	12	12	2	23	54	3	04
Proof	107	10	2	05	74	0	15

	C.	qr.	℔.	C.	qr.	℔.
Bought	194	3	27	454	1	17
Sold	99	2	16	196	3	22
Unſold	95	1	11	257	1	23
Proof	194	3	27	454	1	17

If ſeveral Quantities of *Groſs Weight* be given, out of which you would ſubtract the *Tare*, in ſuch a Caſe add the *Groſs Weight* into one Total : And add the *Tare* likewiſe into one Total. Then ſubtract the Total of the *Tare* from the Total of the *Groſs*, the Remainder is *Neat* Weight.

Example.

A Merchant ſells 6 *Hogſheads of* Sugar, *viz.*

	C.	qrs.	℔.		C.	qrs.	℔.
N°. 1 Gr.	14	2	10	Tare	1	3	15
2	7	1	19		2	0	05
3	16	2	14		2	1	10
4	17	1	10		2	1	16
5	18	2	17		2	1	12
6	14	1	22		1	3	22
Groſs	99	0	03	Tare	12	3	24
Tare	12	3	24				
Reſt Neat	86	0	12				

Subtraction of Troy *Weight.*

	oz.	pw.	gr.	oz.	pw.	gr.
Bought	115	07	05	976	11	06
Sold	94	3	10	149	14	11
Reſt	20	13	19	826	16	19
Proof	115	7	05	976	11	06

	℔.	oz.	pw.	℔.	oz.	pw.	gr.
ought	375	05	13 ½	194	3	09	16
old	196	10	17 ¼	95	7	14	18
eſt	178	06	16 ¼	98	7	14	22
roof	375	05	13 ½	194	3	09	16

I might proceed to give Examples in Subtraction of Liquid Meaſure, Dry Meaſure, Long Meaſure, Apothecaries Weights, Time, Motion, *&c.* but there being no more Difference between the working of theſe and thoſe *Examples*, than only obſerving the Tables of each, which are delivered in the Second Chapter, therefore I forbear, this being ſufficient for the meaneſt Capacity.

CHAP. IV.

Of MULTIPLICATION.

I. IN *Multiplication* there are always Two Numbers given to find out a Third, which ſhall contain either of the given Numbers as many times as the other containeth a Unit.

II. Of the Two Numbers given, the one is called the *Multiplicand*, and the other is called the *Multiplier*, and the Number found out by the Operation is called the *Product*.

III. The *Multiplicand* is the Number given to be multiplied, and is uſually, for Order Sake, the biggeſt of the Two given Numbers.

IV. The *Multiplier* is that by which the *Multiplicand* is multiplied, and is uſually the leaſt Number.

V. The *Product* is the Number produced by the *Multiplication*, and it containeth the *Multiplier* as many times as the *Mulplicand* containeth Units:

or

it containeth the *Multiplicand* as often as the *ltiplier* containeth Units.

VI. *Multiplication* is either *Simple* or *Compound*.

VII. *Simple Multiplication* is when the *Multiplicand* the *Multiplier*, do each of them conſiſt of one le Figure only: As if it were required to multi- 4 by 3, 5 by 2, 9 by 7, &c. Here 3 times 4 is and 2 times 5 is 10, and 7 times 9 is 63; now 10 and 63, are the *Products* of each *Multiplication*.

VIII. All the Variety of *Simple Multiplication* is tained in the following Table, which muſt be ned by heart, before the Learner can make any her Progreſs.

Multiplication TABLE.

2 times	2 is	4
	3	6
	4	8
	5	10
	6	12
	7	14
	8	16
	9	18
	10	20
	11	22
	12	24
3 times	3 is	9
	4	12
	5	15
	6	18
	7	21
	8	24
	9	27
	10	30
	11	33
	12	36
4 times	4 is	16
	5	20
	6	24
	7	28
	8	32
	9	36
	10	40
	11	44
	12	48
5 times	5 is	25
	6	30
	7	35
	8	40
	9	45
	10	50
	11	55
	12	60
6 times	6 is	36
	7	42
	8	48
	9	54
	10	60
	11	66
	12	72
7 times	7 is	49
	8	56
	9	63
	10	70
	11	77
	12	84
8 times	8 is	64
	9	72
	10	80
	11	88
	12	96
9 times	9 is	81
	10	90
	11	99
	12	108

IX. *Compound Multiplication* is when the *Multipli-and*, or *Multiplier*, or both of them, do conſiſt of *ompound Numbers*, that is, of more Figures or Places han one.

As if it were required to multiply 324 by 2, here he *Multiplicand* is 3[illegible] which conſiſteth of 3 Places, nd the *Multiplier* is 2.

X. When it is required to multiply one Number y another, firſt ſet down the biggeſt Number for he *Multiplicand* and under that the *Multiplier* in uch Order as has been taught in Addition and Subraction, *viz.* Units under Units, Tens under Tens, &c. and draw a Line under them.

As if it were required to multiply 324 by 2, I ſet hem down as followeth, *viz.*

The *Multiplicand* 324
The *Multiplier* 2

Then I begin with the Place of Units, ſaying, times 4 is 8, which I put under the Line; then times 2 is 4, which I alſo put under the Line; nd 2 times 3 is 6, which I alſo put under the Line; nd the Work is finiſhed: So that I find 324 being multiplied by 2, produceth 648, as by the followng Work.

The *Multiplicand* 324
The *Multiplier* 2

The *Product* 648

XI. When the *Product* of any ſingle Figure mounts to 10, or a certain Number of Tens, then ou are to ſet down a Cypher, and carry a Unit or every Ten to the Product of the next Figure; r if it comes to above 10, or any Number of Tens, then ſet down the Exceſs, and carry an Unit for every Ten, *&c.* as in the following Example.

Let it be required to multiply 785641 *by* 5.

The Number being ſet down according to the Tenth Rule, I begin, ſaying, 5 times 1 is 5, which I put under the Line, and proceed, ſaying, 5 times 4 is 20, wherefore I put down 0, and carry 2 for the 2 Tens to the next, ſaying, 5 times 6 is 30, and 2 that I carried is 32, wherefore I put down 2 and carry 3 from the 3 Tens to the next Figure, ſaying 5 times 5 is 25, and 3 that I carried is 28, wherefore I put down 8, and carry 2 to the next, ſaying, 5 times 8 is 40, and 2 that I carry is 42, ſo I put down 2, and carry 4 to the next Figure, ſaying, 5 times 7 is 35, and 4 that I carry is 39, which being the laſt Figure, I put down 39 under the Line, and ſo the Work is finiſhed, and I find that 785641 being multiplied by 5, the Product is 3928205, as appears by the whole Work in the Margent.

$$\begin{array}{r} 785641 \\ 5 \\ \hline 3928205 \end{array}$$

And here, by the way, Note, *That Multiplication is a Compendious Performance of Addition*; for in the laſt Example, if inſtead of multiplying 785641 by 5, I put down the Multiplicand 5 Times in order one under the other, and add them all together, then will the Sum of them amount to the Product that was found by the foregoing Work of Multiplication, as appears by the Work in the Margent. The ſame may be performed by any other Example.

$$\begin{array}{r} 785641 \\ 785641 \\ 785641 \\ 785641 \\ 785641 \\ \hline 3928205 \end{array}$$

Other *Examples* for this Rule for Practice may be ſuch as follow.

748046	570084	7115083
4	6	8
2992184	3420504	56920664
72190	35726	145796
9	5	10
649710	178630	1457960

XII. When the *Multiplier* conſiſts of divers Places, then muſt there be as many *particular Products* as there are places therein, and for the true placing of each Product, obſerve to put the firſt Figure or place of Units under its proper *Multiplier*, and when you have done, draw a Line under the whole Work, and add the *ſeveral Products* together, and their Sum will be the total *Product* required.

Example I.

Let it be required to multiply 46753 *by* 46.

```
 46753
    46
------
280518
 87012
------
150638
```

Having placed the given Numbers in order to the Work, according to the Tenth Rule of this Chapter, and drawn a Line under them, as you ſee in the Margin; I begin to multiply with the 6, ſaying, 6 times 3 is 18, wherefore I put down 8 under the Line, and carry 1 to the next, ſaying, 6 times 5 is 30, and 2 that I carry is 32, &c. ſo that the *Product* by 6 is 280518. Then I begin with the 4, ſaying, 4 times 3 is 12, wherefore I put down (under the Line, and under the Figure 4, by which I multiply) and carry 1 for the Ten to the next, ſaying, 4 time 5 is 20, and 1 that I carry is 21; wherefore I ſet down 1, and carry 2 to the next, *&c.* and I find the ſingle Product by 4 to be 187012, and ſo the Multiplication is ended: Then I draw a Line under theſe Two particular Products, and add them together in the Order as they ſtand, and the Sum is 2150638, which is the true Product of 46753 being multiplied by 46, that is, 46 times 46753, is 2150635, and is equal to the Sum of 46753, being ſet 46 times one under another and added together. Behold the whole Work of Multiplication in the Margent.

Example II.

Let it be required to multiply 5800846 *by* 478.

Firſt, I diſpoſe of the given Numbers in order to the Operation, according to the Tenth Rule foregoing.

Then I begin and multiply the whole *Multiplicand* by (the firſt Figure of the *Multiplier*) 8, and the Product thereof is 46406768; then I multiply the ſame again (by the ſecond Figure of the Multiplier) 7, and the Product thereof, 40605922, the firſt Figure whereof, *viz.* 2. I place under the 7 by which I multiply. Then I proceed to multiply by 4, and the Product thence ariſing is 23203384; the firſt Figure whereof, which is 4, I place under 4, by which I multiply, and all the reſt in their Order, and ſo the whole Work of *Multiplication* is finiſhed: Then I draw a Line under all, and add up the ſeveral Products, and their Sum is 2772804388, which is the Total Product.

```
     5800846
         478
 -----------
    46406768
   40605922
  23203384
 -----------
  2772804388
```

A General Rule in Multiplication is chiefly to obſerve, That in whatſoever place the Figure of the Multiplier (whether a Cypher or Cyphers) ſtands from the place of Units, in the ſame place muſt the firſt Figure of that Multiplication be ſet from the Unit of the Multiplicand.

And ſince the greateſt Difficulty in Multiplication ariſes from having a Cypher or Cyphers in the Multipliers, I ſhall endeavour to make it plain and eaſie by the following Examples.

Example I.

Where there is one or more Cyphers in the Multiplier betwixt ſignificant Figures.

(2)	(1)
45793	8465008
507	4006
320551	50790648
2289650	3386033200
23217051	33910822048

In the firſt Example, you ſee that the Cyphers are put at the ſame Diſtance from the Unit of the Multiplicand that they ſtand in from the Unit of the Multiplier; as 4, the Fourth Figure of the Multiplier (the firſt Figure in that Multiplicand, which is 2) is ſet in the Fourth place from the Unit of the Multiplicand.

Example II.

Where the Multiplier hath one or more Cyphers to the Right hand thereof.

(1)
546735
4620

10934700
3280410
2186940

2525915700

(2)
7645932
48000

61167456
30583728

367004736000

Or, *You may multiply by the ſignificant Figures*, neglecting the Cyphers *(as in the ſecond Sum) as if there were none, only to the Product annexed, as many Cyphers as there were Cyphers in the Multiplier.*

Example III.

Where the *Multiplicand* and *Multiplier* have each of them Cyphers at the Right hand.

(1)
58400
760

3504000
408800

44384000

(2)
438700
67000

30700
26322

29392900000

Or, *You may* neglect the Cyphers *(as in the ſecond Sum) only to the Product annex as many Cyphers as there were Cyphers to the Right hand of the Multiplicand and Multiplier.*

XIII. When the *Multiplier* conſiſts of a Unit in the higheſt place towards the Left-hand, and all the reſt Cyphers towards the Right-hand, as 10, 100, 1000, *&c.* then is the whole Work performed by annexing the Cyphers of the Multiplier to the Figures of the Multiplicand; as in the following Examples.

6507	6507	6507
1000	100	10
6507000	650700	65070

XIV. *It is neceſſary for all ſuch as would be dextrous and ready at* Arithmetick *to learn to multiply by theſe Compound Numbers following very readily at one Operation,* viz.

Exa. Mult.	574967	Mult.	842958
by	11	by	12
	fa. 6324637	*fa.*	10115496
	345786		859427
	110		120
Product	38036460	*fa.*	103131240
	7504675		3217295
	12		12
	90056100		38607540

Here 574967 is multiplied by 11 thus, 11 times 7 is 77, put down 7, and carry 7, and then 11 times 6 is 66, and 7 I carry is 73 put down 3, and arry 7, then 11 times 9 is 99, and 7 I carry is 06, put down 6, and carry 10; then 11 times 4 is

44 and 10 I carry is 54, put down 4 and carry 5; then 11 times 7 is 77 and 5 is 82, put down 2, and carry 8, then times 11 5 is 55, and 8 I carry is 63; which put down to the Product of 574967 multiplied by 11 is found to be 6324637.

In like manner to multiply 942958 by 12, ſay, 12 times 8 is 96, put down 6, and carry 9, then 12 times 5 is 60, and 9 I carry is 69 put down 9 and carry 6, and ſo proceed 'till you have gone through your Sum.

To multiply any Number by 110, or 120, put down a Cypher, and multiply as before.

Multiply	425760	Multiply	543760
by	12000	by	1200
Product	5109120000	*fa.*	652512000

The Proof of Multiplication.

§ XV. When you would prove the Truth of your Work in Multiplication, firſt, with your Pen make a Croſs, then add the Figures of the Multiplicand together, not conſidering their Value as to the Places they poſſeſs, but as if they were all Units, caſting away the Nines as often as may be, and put the laſt Remainder on the Left ſide of the Croſs made for that Purpoſe, then likewiſe add the Figures in the *Multiplier* together, caſting away the Nines as often as may be, and put the laſt Remainder on the Right ſide of the Croſs, then multiply theſe two Remainders one by another, and caſt away all the Nines out of their Product, and put the Remainder above the Croſs, then add together the Figures of the Product, caſting away the Nines as often as may be, and put the laſt Remainder under the Croſs, and then look i the Figure above the Croſs, and the Figure below the Croſs be equal, then is your Summ rightly performed, otherwiſe not.

As for Example: Let it be required to multiply 587464 by 465; when the Work is finiſhed, I find the Product to be 273170760, as by the following Work appears.

6
7 + 6
6

587464
465

2937320
3524784
2349856

273170760

Now to prove whether the Work be rightly perform'd, I firſt make a Croſs as you ſee above, and then begin to add the Figures of the *Multiplicand* together, ſaying, 5 and 8 is 13, caſt away 9 and there reſts 4; then 4 and 7 is 11, caſt away 9 and there reſts 2; then 2 and 4 is 6, and 6 is 12, caſt away 9 and there remains 3; then 3 and 4 is 7, which I put down on the Left ſide of the Croſs: Then I add together the Figures of the *Multiplier*, as I did thoſe of the *Multiplicand*, and the laſt Remainder there is 6, which I put on the Right-ſide of the Croſs; then do I multiply theſe two Figures together which ſtand on each ſide of the Croſs, *viz.* 6 and 7, and their Product is 42, out of which I caſt the Nines as often as may be, and there remains 6, which I put on the top of the Croſs. But the eaſieſt way to caſt the Nines out of any Number, is to add the Figures together which conſtitute that Number, and their Summ is the Remainder when the Nines are caſt away as often as may be, ſo in this Example the Nines are eaſily caſt out of 42 (which ist he Product of 6 by 7) for 42 is conſtituted of 4 and 2, whoſe Sum is 6; but if the ſaid Sum chance to come to more than 9, caſt 9 out of it, and put down the Remainder, ſo 8 times 7 is 56, the Sum of which Figures (5 and 6) is 11, out of which taking 9 there reſts 2; which is the true Remainder, when the Nines are caſt out of 56 as often as may be.

Now, in this Example, having put the ſaid Remainder 6, above the Croſs, I proceed to caſt away the Nine out of the Product, and there remains 6 likewiſe, which I put below the Croſs, and becauſe the Figure above and below the Croſs are equal, *viz.* each 6, I conclude the Work to be truly performed.

But the true Proof of *Multiplication* is by *Diviſion*, as ſhall be taught in that Rule, this way by caſting away the Nines many times proving the Work to be true, when it is abſolutely falſe, but when it proveth not true this way, the Sum cannot be right,

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CHAP. V.

Of DIVISION.

DIVISION *Teacheth to Divide any given Number into as many equal Parts as you pleaſe*, Or,

It is that by which we diſcover how often one Number is contained in another.

II. In *Diviſion* there are always Three Numbers *certain*, and a fourth *accidental*.

III. Of the Three Numbers *certain*, Two are always given to find out a Third, *viz.* The one of the Numbers given is to be *Divided*, the other Number given, is that by which the firſt is *Divided*, and the

Number found out is the *Quotient*, and diſcover how often the one Number is contained in the other.

IV. Therefore in this Rule are three remarkable Numbers, *viz.* The *Dividend*, the *Diviſor*, and the *Quotient.*

(1.) The *Dividend* is the Number given to be divided into equal Parts.

(2.) The *Diviſor* is the Number given by which the *Dividend* is to be divided, which declareth into how many equal parts the *Dividend* is to be divided.

(3.) The *Quotient* is the Number invented by the Operation, and ſhews how often the *Diviſor* is contained in the *Dividend.*

And the *Remainder* is the Number which remains after the *Diviſion* is ended, which is uncertain, and is the Fourth accidental Number, I mentioned before.

As ſuppoſe 15 were given to be divided by 3, or 15 Shillings to be divided amongſt 3 Men, here 15 is the *Dividend*, 3 is the *Diviſor*, and 5 is the *Quotient*, for 3 is contained in 15 juſt 5 times, without any *Remainder*, but if you were to divide 20 by 3, the *Quotient* would be 6, and the *Remainder* 2, for 3 is contained 20, 6 times, and 2 remains over.

In *Diviſion (by one Figure)* you are firſt to write down the *Dividend*, and then draw a crooked Line, and place the *Diviſor* on the Left hand thereof, then draw a Line under the *Dividend*, under which place your *Quotient.*

Example.

Let it be required to divide 45 by 9; here the *Quotient* is 5, becauſe 9 is contained in 45, 5 times, and theſe ought to be placed as followeth.

Dividend
Diviſor 9) 45
Quotient 5

V. When a Number is given to be divided by a ſingle Figure or Digit, if the firſt Figure of the *Dividend*, viz. (*that on the Left-hand*) be bigger, or at leaſt equal to the *Diviſor*, you are to put a Point or Prick under the ſame, and proceed as followeth.

Example.

Suppoſe it were required to divide 6788 by 4, the given Numbers are placed as before directed, making a Prick under (6) the firſt Figure of the *Dividend*, which for Diſtinction ſake may be called the *Dividual*, as followeth.

Dividend
Diviſor 4) 6788
Quotient 1697

Note, In every *Diviſion* you are to obſerve this Method ; firſt, To *Seek* ; ſecond, To *Multiply* ; thirdly, To *Subtract*.

As in the laſt Example, after you have writ down your *Dividend* and *Diviſor*, as was ſhewed you, firſt ſeek how often (or how many times) 4, which is the *Diviſor*, can you have in 6, which is the firſt Figure of the *Dividend* towards the Left-hand ; the Anſwer is once ; which I place in the *Quotient* exactly under the 6, (as you ſee in the Operation of the Sum) and ſay, once 4 out of 6, there will remain 2, which 2 is two tens to the next Figure 7, and makes the new *Dividual* 27 Then ask again (*or ſeek*) how often 4, the *Diviſor*, can you have in 27? *Anſwer*, 6 times, which 6 place in the *Quotient* under 7, the ſecond Figure of the *Dividend*, then take 6 times 4, which is 24 out of 27, there will remain 3, which is three Tens to 8, the third Figure of the *Dividend*, and makes it 38. Then ask again, how many times 4 can you have in 38? *Anſwer*, 9 times; which 9 place in the *Quotient* under 8, the third Figure of the *Dividend*; then take 4 times 9, which is 36, out of 38, there will remain 2, which is two Tens to the fourth and laſt Figure of the *Dividend*, and makes the 8 to be 28. Then *laſtly*, Seek how often the *Diviſor* 4 can you have in 28; *Anſwer*, 7 times, which I place under 8, the laſt Figure of the *Dividend*, and your Work is done; the *Quotient* being found to be 1697, which is the Number of times the *Diviſor* 4 is found in the *Dividend* 6788. Or if the ſaid Sum were to be divided between 4 Men, each Man's Share would be 1697 Pounds.

But to make this plain to any ordinary Capacity, I ſhall take the *Dividend* into pieces, to ſhew the four ſeveral Operations of the laſt Sum, and then give you ſome Examples for your Practice therein.

		Dividend
Diviſor	4)	6788
Quotient		1697

4)	6	27	38	28
	1	6	9	7

If you take 1 time 4 out of 6, there will remain 2 to the ſecond Figure 7 which makes it 27; then 4 in 27, there will be 6 times, and 3 will remain to the third Figure 8, which makes it 38; then 4 in 38, there will be 9 times, and 2 will remain to the fourth Figure, which is 8, and makes it 28; then 4 in 28 is 7 times, which place under 8, the laſt of your *Dividend*, and your *Quotient* will be 1697.

Examples for the Learner's Practice.

(1)
5) 712640
142528

(2)
6) 721494
120249

(3)
7) 42165
$6023\frac{4}{7}$

VI. *If you cannot take the Diviſor out of the Dividend*, as in the ſecond Example, then are you to put a Cypher in the Quotient, and reckon that Figure as ſo many Tens to the next, as before was ſhewed you in the leaſt Rule.

Example.

6) 721494
120249

Say, *6* in 7 once, reſt 1, which makes the 2, 12; then *6* in 12, 2 times; then *6* in 1, 0 times, reſt 1, which makes the 4, 14; then *6* in 14, 2 times, reſt 2, which makes the 9, 29; then *6* in 29, 4 times, reſt 5, which makes the 4, 54; then 6 in 54, 9 times; ſo the Quotient is 120249.

VII. *If after you have divided, there remains any thing*, that which remains is called a Fraction, and muſt be placed at ſome diſtance from the laſt Figure of the Quotient in a leſſer Character, then draw a ſmall Stroke under it, and place your Diviſor under, as in the Example following.

(4)
7) 54934
$7847\frac{5}{7}$

(5)
8) 316495
$39561\frac{7}{8}$

(6)
9) 3142565
$34917\frac{3}{9}$

VIII. *To prove your Diviſion,* Multiply your Quotient by the Diviſor, to which add the Remainder; if the Product be the ſame as your Dividend is, your Work is true.

	8) 85436	7) 364153	9) 314254
	$10679\frac{4}{8}$	$52021\frac{6}{7}$	$34917\frac{1}{9}$
Proof	85436	364153	314254

To prove this Example, where I to divide by 9, I multiply 7 the Unit of my Quotient, by 9, the Diviſor, which makes 63, and the Remainder I added to it, makes 64; ſo I put 4, and carry 6, and ſay 9 times 1 is 9, and 6 is 15, 5 and carry 1; then 9 times 9 is 81, and 1 I carry is 82, 2 and carry 8; then 9 times 4 is 36, and 8 is 44, 4 and carry 9; then 9 times 3 is 27, and 4 is 31, which put down, ſo the Product is 314853, the Sum equal with the Dividend, which was to be proved.

IX. *But if the firſt Figure of the Dividend towards the Left-hand, be leſſer than the firſt Figure of the Diviſor,* as is the Fifth and Sixth *Examples* of the Seventh Rule; then make the Two firſt Figures your Dividual, and proceed as before.

Other Examples of Diviſion *by the foregoing Rules, without their Proofs.*

	9) 51376	11) 413795	12) 413271
Quot.	$5708\frac{4}{7}$	$37617\frac{8}{11}$	$34439\frac{3}{12}$
Proof,	51376	413795	413371

To divide by 11, ſay, 11 in 41, 3 times, reſt 8, which makes the 3, 83; then a 11 in 83, 7 times, reſt 6, which makes the 7, 67; then 11 in 67, 6 times, reſt 1, which makes the 9, 19; then 11 in 19, 1 time, reſt 8, which makes the 5, 85; then 11 in 85, 7 times, the Remainder is $\frac{8}{11}$, ſo the Quotient is 37617 $\frac{8}{11}$.

And after this manner you may divide any Number by 12, 120, or 1200, as in the following *Examples*, the *Multiplication Table* being ſo compoſed, as to aſſiſt you in the multiplying and dividing by 11 and 12 as readily as by any other ſingle Figure.

X. To divide any Number by 10, 100, or 1000, as many Cyphers as you have in your *Diviſor*, cut off ſo many Figures from the Unit of your *Dividend*, as in the following *Examples.*

1|0 4150|7   1|00) 3142|67   1|000) 91|437

Quot. 4150 $\frac{7}{10}$ 3142 $\frac{67}{100}$ 91 $\frac{437}{1000}$

XI. *But if the Figure of the Diviſor be more than a Unit, and Cyphers follow it*, in ſuch Caſes, as many Cyphers as you have in the Units of your *Diviſor*, cut off ſo many Figures from the Unit of your *Dividend*, and proceed to divide as in ſingle Figures.

7|0) 5432|6   3|00) 84295|67

Quotient. 776 $\frac{6}{70}$ 28098 $\frac{167}{300}$

Proof 54326   8429567

Various Examples for the Learner's Practice.

	11 0) 372045|6	12|0) 412678|5
Quotient	$33822\frac{36}{110}$	$34389\frac{105}{120}$
Proof	3720456	4126785
	11 00) 62149 65	12 00) 814653 70
Quotient	$56499\frac{775}{1100}$	$67887\frac{970}{1200}$
Proof	62149675	81465370

Various Examples for the Learner's Practice.

Diviſion *by Two or more Figures*, being the hardeſt Leſſon in Arithmetick, muſt be heedfully attended by the Learner, for whoſe eaſe I ſhall endeavour to make the way ſmooth, both by Rules and Examples.

XII. *When the Diviſor conſiſteth of more place than one*, then you are to ſet out ſo many Figures on the Left-hand of the *Dividend* for a *Dividual*, and then put a point under that Figure of the *Dividual* which ſtands next to the Right-hand.

Then ſeek how often the firſt Figure towards the Left-hand of the *Diviſor*, is contained in the Firſt Figure towards the Left-hand of the ſaid *Dividual*, and place the *Anſwer* in the *Quotient*.

Then multiply the whole *Diviſor* by the ſaid Figure, ſo placed in the *Quotient*, and place the *Product* in order under the *Dividual*.

Which being done, ſubtract the ſaid *Product* from the *Dividual*, placing the *Remainder* below the Line.

Then put a Point under the next Figure [illegible] *Dividend* and annex it to the *Remainder*, ſo [illegible] a new *Dividual*, with which you are to [illegible] before directed.

Example I.

Let it be required to divide 8904 *by* 42.

Here the given Number being diſpoſed of according to the Fourth Rule of this Chapter, will ſtand as followeth.

42) 8904 (

Then, becauſe there are 2 Places in the Diviſor, I take the two firſt Figures on the Left-hand of the Dividend for a Dividual, which is 89, putting a Point under the 9, which is that Figure of the Dividual which ſtands next to the Right-hand.

Then I ſeek how often the firſt Figure (4) of the Diviſor, is contained in the firſt Figure (8) of the Dividual, and the Anſwer is 2 times, wherefore I put 2 in the Quotient, and thereby I multiply the Diviſor 42, and the Product is 84, which I place in order under the Dividual 89, and ſubtract it therefrom, and the Remainder is 5.

Then I put a Point under the next place, which is (0), and annex to the ſaid Remainder 5, and it makes 50 for a new Dividual, and then the Work will ſtand as followeth.

```
42) 8904 (2
     ..
    84
    ——
     50
```

[illegible] the next place I ſeek how often I can have the [illegible] Figure of the Diviſor (which is 4) in the firſt [illegible] of the Dividual 50 (which is 5) and the [illegible] is 1 time, wherefore I put 1 in the Quoti[illegible] thereby multiply the Diviſor 42, and the [illegible], which I place in order under the Di[illegible] and ſubtract it therefrom, and the Remainder is 8, which I place in order under the Line, and thereto annex the next Figure of the Dividend, which is 4, (having firſt put a Point under it) and it makes 84 for a new Dividual, and then the Work will ſtand as followeth.

42)°904(212
84
———
50
42
———
84
84
———
0

3 Then I again ſeek how often the firſt Figure of the Diviſor (which is 4) is contained in the firſt Figure of the Dividual (which is 8) and the Anſwer is 2 times, wherefore I put 2 in the Quotient, and thereby multiply the Diviſor 42, and the Product is 84, which I place orderly under the Dividual 84, and ſubtract it therefrom, and there remains 0. So is the Operation ended, and I find that 8904 being divided by 42, the Quotient is 212, as by the foregoing Operation appeareth.

XIII. *When you have multiplied the Diviſor by the Figure placed in the Quotient*, if the Product chance to be greater than the Dividual, then you may be ſure that the Figure placed in the Quotient is too much; wherefore in ſuch a Caſe you muſt cancel that Figure, and in the room thereof put one that is leſs by an Unit, and if the Product be yet bigger than the Dividual, place yet a leſſer Figure than that in the Quotient, and then proceed as has been before directed.

Example II.

Let it be required to divide 7868 by 37. The given Number being placed according to former Direction, I begin the Work, and firſt I ſeek how often I can have 3; (the firſt Figure of the Diviſor) in 7 the firſt Figure of the Dividual 8, (having before put a Point under the 8,) and the Anſwer in 2 times, wherefore I put 2 in the Quotient, and thereby multiply the Diviſor 37, and the Product is 74; which being ſubtracted from the Dividual 78, there remains 4, to which having annexed the next Figure of the Dividend (6) it makes 46 for a new Dividual. Then I proceed to ſeek how often 3 is contained in 4, and the Anſwer is 1 time, wherefore I put 1 in the Quotient, and thereby multiply the Diviſor 37, and the Product is 37, which being ſubtracted from the Dividual 46, the Remainder is 9, to which the next Figure of the Dividend being annexed, *viz.* 8, it makes 98 for a new Dividual. Then I proceed to ſeek how often I can have 3 in 9, and the Anſwer is 3 times, wherefore I put 3 in the Quotient, and thereby I multiply the Diviſor 37, and the Product is 111, which is more than the Dividual, whereby I perceive that I have put a Figure too big in the Quotient; therefore, according to the Directions given in the foregoing Rule, I cancel the 3, and inſtead thereof I place a 2, and then multiply the Diviſor thereby, and the Product is 74, which is leſſer than the Dividual, wherefore I make Subtraction, and there remains 24; and ſo having never another Figure to bring down from the Dividend, I conclude the Work to be ended, and the Quotient thus found is 212, as by the following Operation appears.

2d *Example*, 37) 7868 (213

74

46
37

98
XXX
74

Remainder (24)

And here Note, That if at any time it ſo happens, that after you have multiplied the Diviſor by the Figure laſt placed in the Quotient, and Subtracted the Product from the Dividual, if the Remainder be greater than the Diviſor, the Figure laſt placed in the Quotient is too little, and therefore it muſt be cancelled, and a bigger Figure placed in its room. What is to be done with the Remainder after Diviſion is ended, ſhall be ſhewed in its due place, but only for the preſent let it ſuffice to underſtand, That it is the Numerator of a Fraction, which is part of the Quotient, the Diviſor being the Denominator to the ſame. So the true Quotient of the laſt Diviſion is $212\frac{34}{27}$. But more of this hereafter.

XIV. *When* (according to the Directions given in the laſt Rule) *you have aſſigned your* Dividual *to conſiſt of as many Places as the* Diviſor *containeth Places*, if then the Dividual be leſs than the Diviſor (ſo that the Diviſor cannot be ſubtracted therefrom) you are then to annex another Figure thereto, ſo that then it will conſiſt of one place more than the Diviſor hath Places, and then you are to ſeek how often the firſt Figure of your Diviſor is contained in the two firſt Figures of the Dividend; and then proceed according to the Rules before delivered.

The like is to be obſerved in the middle of your Work if the Dividual chance to conſiſt of one Figure more than the Diviſor, as in the following Example.

Example III.

Let it be required to divide 4763585 by 587.

Here, becauſe the Diviſor 587 conſiſteth of 3 places, therefore I ſhould take the three firſt Figures to the Left hand of the Dividend for a Dividual, which is 476, but becauſe 476 is leſſer than the Diviſor 587, I therefore put another Figure thereto, and then I have 4763 for a Dividual, and having firſt put a Point under the Figure 3, I begin the Diviſion, and firſt I ſeek how often 5 (the firſt Figure) of the Diviſor, is contained in 47 (the two firſt Figures of the Dividend) which I find to be 9 times, but having tryed according to the Thirteenth Rule of this Chapter, I find 9 is too much, but it will bear 8, wherefore I put 8 in the Quotient, and having multiplied the Diviſor thereby, and ſubtracted the Product from the Dividual, according to the Direction given in the Twelfth Rule of this Chapter, I find the Remainder to be 67, to which I annex the next Figure of the Dividend, which is 5, having firſt put a Point under it (according to the ſaid Twelfth Rule) and then I have 675 for a new Dividual. Then I ſeek how oft 5 (the firſt of the Diviſor) is contained in 6, (the firſt of the Dividend) and the Anſwer is 1, which I put in the Quotient, and having multiplied and ſubtracted, I find the Remainder to be 88, to which annexing the next Figure in the Dividend, it makes 888 for a new Dividual, then I ſeek, *&c.* and after Subtraction, there is a Remainder of 301, to which annexing the next and laſt Figure of the Dividend which is 5, it makes 3015 for a Dividual, which conſiſteth of one place more than the Diviſor, therefore, according to the latter part of the Fourteenth Rule, I ſeek how often 5 is contained in 30, and by tryal, according to the Tenth Rule, I find it will bear 5 times, wherefore I put I 5 in the Quotient, and having multiplied and ſubtracted, I find the Remainder to be 80, and the Work is ended, and I find the Quotient to be $8115\frac{80}{587}$. See the following Work.

3d. *Exam.* 587)4763585
4696
Quot. 8115
675
587
888
587
3015
2935
080 Remainder.

Exam. Divide 72164375 by 9437
9437) 66059··· (7646 *Quot.*
61053
6622
44317
37748
65695
56622
Remaider 9073

Thus have I run through one ſort of Diviſion, and I hope by this time the Learner is able to divide any Number given; and here let him take notice once for all, that there muſt never be brought down but one Figure or Cypher at one time from the Dividend, to be annexed to the Remainder for a new Dividual, and for every ſuch Figure or Cypher ſo brought down, there muſt be a Figure or Cypher put in the Quotient.

I might give you many more Examples of *Diviſion*, wherein the Diviſor may conſiſt of 4, 5, 6, 7, 8, 9, 10 *&c.* places, but the Method being the very ſame with what is before delivered, I ſhall therefore forbear, and only admoniſh the Learner to be perfect in the foregoing Rules, and to practice well the Examples therein delivered; and for further Practice, I ſhall give you the Quotients of Four other Examples, but ſhall omit the Operation as a Whetſtone for the Learner's Ingenuity.

If you divide 2459337266 by 384, the Quotient will be 63942, and the Remainder, after the Work is finiſhed, 562.

And if you divide 49267345806877 by 5846793, the Quotient will be 842639, and there will be a Remainder of 150.

Or if you divide 107925884216 by 1998573, the Quotient will be 540008, and there will be a Remainder of 475632.

Alſo if you divide 2395096414141498 by 297864, the Quotient will be 8040905964, and there will be a Remainder of 80602.

There is yet a much ſhorter (way of) Diviſion, by omitting to ſet down the Multiplication of your Diviſor (as is done in the foregoing Examples) and in this you multiply and ſubtract together: In which way the Quotient is placed under the Diviſor, as being moſt ready and convenient for the working of any Summ. And being the moſt accurate and ready way of Diviſion, I ſhall purſue this Method through the remaining part of this Book, after I have given three or four Examples of one, and the ſame Sum divided by both ways for the Learners Eaſe and Practice.

Let us divide the two laſt foregoing Sums by this ſhort *Italian* way of Diviſion, *viz.* the third and fourth Examples.

Firſt of all, Let it be required to divide 4763585 by 587, being the third Example.

Firſt, I proceed and aſk the Queſtion, as was ſhewed you in the third Example of this Rule, and ſay, how often 5, the firſt Figure of the Diviſor, can I have in 47, the firſt Figures of the Dividend ? Anſwer, 8 times. Then multiply 7, the Unit Figure of your Diviſor, by 8, the Figure which you bring in your Quotient, and ſay, 8 times 7 is 56 out of 3 (the Fourth Figure of the Dividend) I cannot, but 56 out of 63, reſt 7, and carry 6 to the ſecond Figure of the Diviſor. Then multiply again, and ſay, 8 times 8 is 64, and 6 I carried is, 70, out of 6 I cannot, but 70 out of 76, reſt 6, and carry 7 to the firſt Figure of the Diviſor; then multiply again, and ſay 8 times 5 is 40 and 7 I carried is 47 out of 47, reſt 0. So that by this Operation you find after 8 times 587 is taken out of 4763, there will remain 67. to which I take down 5, the next Figure of my Dividend, for a new Dividend.

```
587) 4763585
———
8      675
```

Then I proceed again, and ſay, how often 587 (my Diviſor) can I have in 675, my Dividend ? The Anſwer is once, which I put in the Quotient, and multiply as before, and ſay once 7, 7 out of 5 I cannot, but 7 out of 15, reſt 8, and carry 1; then once 8 is 8, and 1 is 9, 9 out of 71 cannot, but 9 out of 17 reſt 8, and carry 1: then once 5 is 5, and 1 I carry is 6, 6 out of 6, there reſts (0) which I omit to place down, becauſe a (0) on the Left-hand is inſignificant: Then to the Remainder 88 I take down 8, the next Figure of my Dividend, and it makes my new Dividend 888.

```
587) 4763585
          ··
———
81     675
        888
```

Then I proceed again, and ask, How often 587 my Diviſor, can I take out of 888, my Dividend? the Anſwer is once, which 1 I put in the Quotient, and ſay, once 7 out of 8 reſt 1; then once 8 is 8, out of 8 reſt 0; then once 5 out of 8 reſt 3; ſo the Remainder of that Diviſion is 301, to which I take down 5, the next Figure of my Dividend, which makes my new Dividend 3015.

```
587) 4763585
          ···
———
81     675
        888
         3015
```

Then I proceed and ask again, how often 587 I can have in my laſt Dividend? the Anſwer is 5 times, which 5 I place in my Quotient, and multiply as before, and ſay, 5 times 7 is 35, out of 5 I cannot, but 35 out of 35 reſt 0, and carry 3; then again, 5 times 8 is 40, and 3 I carry is 43, out of 1 I cannot, but 43 out of 51, reſt 8, and carry 5; then laſtly, 5 times 5 is 25, and 5 I carry is 30, 30 out of 30 reſt 0. So my Remainder of this laſt Diviſion is 80, which I cut off with a ſtroke from the reſt of the Work to ſignifie it to be a Remainder, and the whole Operation of the ſum ſtands as followeth.

Example I.

Dividend.
Diviſor 587) 4763585
Quotient 8115
675
888
3015
80 Remainder

Example II.

9437) Divide 72164375 by 9437
Quotient 7646
61053
44317
65695
9073

56622
37748
56622
66059
71155302
9073

So that 72164375 Proof, is to multiply the Quotient by the Diviſor, and to the Product add the Remainder.

Example

Examples of the ſhort Italian *Way of Diviſion for the Learners Practice, with their Proofs.*

297546) 1489751828835
·········

Quotient 5006;65
297546

30040770
20027180
25033975
35047565
45061155
10013598

1489751825070

3765 Remainder.

1489751828835 Proof.

02021828
2365528
2827063
1491495

3765

The ſame Examples after the long Italian *Way of Diviſion, with their Proofs.*

297546) 1489751828135 (5006795
1487730 ······

2021828
1785276

2365528
2082822

2827063
2677914

1491495
1487730

Remainder 3765

To prove your Diviſion.

1. Multiply your Quotient by your Diviſor (and to the Product add your Remainder, if any be) the Sum of all added together, will be equal to your Dividend, if your Work be true. Or,

2. You may take the ſeveral Products that are placed under each Dividual (in this way of Diviſion) and place them in the ſame Order as they there ſtand in reſpect to one another, and to their Sum add the Remainder, and the Proof will ſtand as followeth.

1487730
1785276
2082822
2677914
1487730
3765 Remainder.

14897518288835 Proof.

Or, You may alſo prove Diviſion by caſting out he Nines; thus,

Firſt, Make a Croſs, then caſt the Nines out of our Diviſor, and place the Remainder on the Left-ide of the Croſs: Then caſt your Nines out of your Quotient, and place the Remainder oppoſite to the ther, on the Right-ſide of the Croſs. Multiply heſe Two Figures together, and out of your Pro-uct caſt the Nines, the Overplus carry to the Re-ainder, and continue to caſt out all the Nines ere-from, and the Remainder above Nine place on e top of the Croſs.

Laſtly, Caſt the Nines out of your Dividend, and f that Remainder comes to be the ſame Figure with at placed on the Top, your Sum is true; then lace that laſt Figure at the bottom of your Croſs.

But the moſt certain Proof of *Diviſion* (as I ſhew ed before) is by *Multiplication*, and the moſt certai Proof of *Multiplication* is by *Diviſion*, they inte changeably proving each other.

For if you divide the *Product* by the *Multiplican* the *Quotient* will be equal to the *Multiplier*.

If you divide the *Product* by the *Multiplier*, th *Quotient* will be equal to the *Multiplicand*.

An Example or two will make this Proof of *Di on* plain.

	(1)	Dividend.		(2)
Diviſor	754)	912673	457)	159137
		1586		2103
Quotient	1210	787	348	3757
		333		101

In the firſt of theſe Two laſt Example my D viſor is 754, Quotient iſ 1210, Remainder is 33 and Dividend 912673. *To prove which*, make Croſs, as in the Margent : Then caſt the Nines out of the Diviſor, there will remain 7, which I place on the Left ſide of the Croſs, than caſt the Nines out of the Quotient, reſt 4, Multiply 7 by 4, it makes 28, caſt out the Nines, reſt 1, which 1 carry to t Remainder, and ſay 1 and 3 is 4, and 3 is 7, a 3 is 10, caſt out 9, reſt 1, which 1 place above t Croſs.

1
7 +
1

Laſtly, Caſt the Nines out of your Dividend, a there will reſt 1, which place under the Croſs, a your Sum is true.

XV. When the Diviſor conſiſteth of any ot Number with a Cypher or Cyphers annexed ther

th

then cut off the Cyphers of the *Diviſor* with a daſh of the Pen, and as many Cyphers as you cut off from the *Diviſor*, ſo many places muſt you cut off from the *Dividend*; then proceed to divide the remaining Figures of the *Diviſor*, as if there were no ſuch Cyphers or Figures in the *Diviſor* or *Dividend* as you cut off, and if nothing remain after *Diviſion* is ended, then ſhall the Figures you cut off from the given *Dividend* be the true Remainder; but if any thing do remain after *Diviſion* is ended, you are there to annex the Figures of the *Dividend* that were before cut off, ſo ſhall the ſaid Remainder, with the Figures annexed thereto, be the true Remainder.

Example.

Divide 486793 by 15000. Firſt, I cut off the three Cyphers of the *Diviſor*, and alſo three places of the Right Hand of the *Dividend*, ſo have I 15 for my *Diviſor*, and 486 for my *Dividend*, viz.

```
15|000) 486|793 (32
        45
        ——
        36
        30
        ——
         6
```

The ſame ſhort way of Diviſion.

```
15|000) 486|793
———— ————   36
32           6
```

Here I find the *Quotient* to be 32, and the Remainder is 6, to which annexing the Figures cut off from the *Dividend*, *viz.* 793, it makes 6793 for the true Remainder.

Having thus enlarged and finiſhed the firſt Fundamental Rules of *Arithmetick*, their Application ſhall be more particularly Taught, in the following Chapters.

CHAP. VI.

Of REDUCTION.

I. R*EDUCTION Teacheth to reduce Numbers, whether Money, Weight, Meaſure, Time, Motion,* &c. *from one Denomination to another, diſcovering the ſame Value, but in differenet Terms.*

II. The whole Work of *Reduction* is performed b Multiplication and Diviſion.

III. All great Denominations are brought int leſſer of the ſame Value by Multiplication, and this is by ſome called *REDUCTIO DESCENDING.*

IV. All ſmall Denominations are brought into greater of the ſame Value by Reduction and this is by ſome called *REDUCTIO ASCENDING.*

V. *To reduce greater Denominations into leſſer of th ſame Value,* Conſider how many of the *Leſſer* ar equal to one of the *Greater*, and multiply the give Number thereby, ſo ſhall the Product be the Anſwer to the Queſtion.

Example.

Reduce 3468 *Shillings into Pence.*

3468
12
———
Fac. 41616 Pence.

Here I conſider that 12 *Pe* is a *Shilling*, and the *Pence* oug to be 12 times the Number *Shillings*, wherefore I multiply 12 at one Operation, according the Fourteenth Rule of the Fourth Chapter, and the Product is 41616 *Pence*, as in the Margent.

VI. *To reduce Smaller Denominations into Greater*, Conſider how many of the *Smaller* are equal to one of the *Greater*, and divide thereby; the Quotient is the Anſwer to the Queſtion.

Example.

Reduce 41616 Pence into Shillings.

12) 41616

fac. 3468 Shill.

Firſt, Conſider that 12 *pence* is a *ſhilling*, and that the *ſhillings* ought to be a twelfth part of the *pence*; wherefore I divide the given Number by 12 at one Operation, as was ſhewed you in the Eleventh Rule of the Fifth Chapter, and ſay, 12 in 41, 3 times, reſt 5 to the 6 makes it 56, then 56, 4 times, reſt 8, which makes the 1 81; then 12 in 81, 6 times, reſt 9, which makes the 6 96; then 2 is 96, is 8 times, and the Quotient gives me 3468 *ſhillings*, which is the Anſwer to the Queſtion, and may ſerve for a Proof of the foregoing Example.

Note, I would adviſe the Learner to inure himſelf to the moſt ſhort and ready ways of Multiplication and Diviſion, which will very much contract the Operations in *Reduction, viz.* In Reduction of Money, to multiply the *Shillings* by 12 at one Operation, as in Chap. IV. of *Multiplication*, Rule Fourteenth. And likewiſe to divide by 12 at one Operation, as in the 9th and 11th Rules of the Fifth Chapter.

For your further Aſſiſtance in *Reduction*, you ought to have reſpect to the Table of *Coin, Weight, Meaſure*, &c. delivered in the Second Chapter.

Example I.

In 685 *l. I demand how many Shillings, Pence, and Farthings?*

685 *Pounds.*
20
————
13700 *Shill.*
12
————
164400 *Pence.*
4
————
fa. 657600 *Farth.*

Firſt, I multiply by 20 (becauſe 20 *Shillings* is a *Pound*, and the Product is 13700 *Shillings*, then I multiply the *Shillings* by 12, (becauſe 12 *Pence* is a *Shilling*) and the Product is 164400 *Pence*; then I multiply the *Farthings* by 4, (becauſe 4 *Farthings* is a *Penny*,) and the Product is 657600 *Farthings*; as in the Margent.

This or any other Number of *Pounds* might be reduced into *Pence* or *Farthings* at one Operation, without reducing it into the intermediate Denominations.

For if you multiply *Pounds* by 240 (becauſe ſo many *Pence make a Pound*) the Product will be *Pence*; and if you multiply *Pounds* by 960 (becauſe 960 *Farthings* is a *Pound*) the Product will be *Farthings*: So in the foregoing Example 685 *l* being multiplied by 240, the Product you will find to be 164400 *Pence*, and if you multiply 685 *l.* by 960, the Product will be 657600 *Farthings*, for the Reaſons before ſaid.

20 *Shill.*
12
——
240 *Pence.*
4
——
960 *Farth.*
one Pound.

But you may ſay, you cannot well remember how many *Pence* or *Farthings* make a *Pound*, I will therefore teach you how to find it out at any time when you have Occaſion. You may eaſily remember that 20 *Shillings* is a *Pound*, and that multiplied by 12 produceth 240 *Pence*, which being multiplied by 4. produceth 960 *Farthings*, as in the Margent.

Example II.

In 657600 *Farthings, I demand how many Pence, Shillings and Pounds?*

This Queſtion is the Reverſe of the former, and may ſerve for a Proof thereof: Firſt, I divide the *Farthings* by 4, and the *Quotient* is 164400 *Pence*, then I divide the *Pence* by 12, and the *Quotient* is 13700 *Shillings*, and the *Shillings* I divide by 20, and the *Quotient* is 685 *Pounds*; which is equal to the given Number in the firſt *Example*. See the whole Operation as followeth:

4) 657600 *Farthings*.

12) 164400 *Pence*.

2|0) 1370|0 *Shillings*.

Facit 685 *Pounds*.

VII. *When in Reduction Deſcending*, the Number propounded to be reduced conſiſteth of divers Denominations, as of *Pounds*, *Shillings*, *Pence* and *Farthings*, or of *Pounds*, *Ounces*, *Penny-weights* and *Grains*, &c. then you may readily reduce it into the loweſt Denomination: Thus when you reduce an higher Denomination into the next inferiour, add to the Product the expreſſed Parts into which you reduce it, as if you were to reduce *Pounds* into *Shillings*, add to the Product (as you multiply) the *Shillings* that are expreſſed in the Number propounded; proceed in the ſame Method 'till you have reduced the given Number into the Denomination required, as in the following *Example*.

Example III.

Reduce 567 *l.* 15 *s.* 6 *d.* $\frac{3}{4}$. *into Farthings.*

Firſt, I multiply by 20 to bring into *Shillings*, ſaying, 0 times 7 is 0, but 5 is 5 (taking in the 5 that is in the place of Units in the *Rank of Shillings*, and ſetting it in the place of Units in the Product;) then 2 times 7 is 14, and 1 is 15, (taking in the 1 that is in the place of Tens in the *Rank of Shillings*) ſo I ſet down 5 in the place of Tens in the Product, *&c.* the Product is 11355 *Shillings*; then I multiply the *Shillings* by 12 to bring them into *Pence*, ſaying, 12 times 5 is 60, and 6 is 66, (taking in the 6 that ſtands in the *Rank of Pence)*, &c. and the *Pence* make 136266; then I multiply my *pence* by 4, to bring them into *farthings*, ſaying, 4 times 6 is 24, and 3 is 27, taking in the 3 which ſtands in the *Rank of Farthings*, &c. ſo the *Farthings* amount to 545067, as by the whole Operation appeareth, *viz.*

567 *l.* —— 15 *s.* —— *d.* $\frac{3}{4}$.
20
———
11355 *Shillings.*
12
———
136266 *Pence.*
4
———
545067 *Farthings.*

Obſerve the like in any other Example.

VIII. *When in Reduction Aſcending* any thing remains after Diviſion is ended, it is always of the ſame Denomination with the Dividend, as in the following Example.

Example IV.

In 545067 *Farthiugs, I demand how many Pounds.*

Firſt, I divide the given Number of *Farthings* by , and the *Quotient* is 136266 *Pence*, and there remains 3, which is 3 *Farthings*, becauſe the Dividend as *Farthings*.

Then I divide the *Pence* by 12, and the *Quotient* is 1355 *Shillings*, and there remains 6, which is 6 *ence*, becauſe the Dividend was *Pence*.

Then I divide the *Shillings* by 20, and the *Quotient* s 567 *l.* and there remains 5, which is *Shillings*, becauſe the Dividend was *Shillings*: So that I find by he Work, 545067 *Farthings* to be 567 *l.* 15 *s.* 6 *d* $\frac{3}{4}$, s by the following Work.

4) 545067

12) 136266 $\frac{3}{4}$

2|0) 11357 : 6 *d.*

Fac. ℔ 567 : 15 *s.* 6 *d.* $\frac{3}{4}$

This Queſtion is the Inverſe of the *Third Example*, nd may very well ſerve for a Proof thereof, as you ay obſerve at your Leiſure.

Here by the way take Notice, That when you are to divide any Number by 20, that is) to bring *Shillings* into *Pounds*, the beſt way is to cut off a Figure o the Right hand for *Shillings*, and then to take half he Figuree to the Left hand for *Pounds*, and if 1 remain, it is 10 *Shillings* to be added to the Figure irſt cut off. For *Example.*

Where 11355 *Shillings is to be reduced into Pounds,* I cut off the laſt Figure 5 for Shillings, and ſay Half of 11 is 5, Half of 13 is 6, Half of 15 is 7, and there remains 1, which make the 5 Shillings to be 15 Shillings; and this Method ſhall be obſerved hereafter.

1134 *l.* 5 *s.* 0 *d.*

Fac. 67 . 15 . 0

Note, Once for all, That *Reduction Aſcending* proves *Reduction Decending*, the one being a Reverſe to the other, as ſhall be demonſtrated in the enſuing Queſtions that follow in all the Varieties of *Reduction.*

In 7642 *l.* 17 *s.* 11 *d.* $\frac{1}{8}$, *I demand how many (half Farthings*

20

152857 *Shillings.*

12

1834295

8

Fac. 14674361 *half Farthings.*

Tun. C. qr. ℔.

Queſt. 1. *In* 95 : 11 : 3 : 15 *how many Pounds (Weight*

Averdupois Weight.

20

1911 *hundreds.*

44

7647 *quarters.*

28

61181

15295

Facit 214135

C. qr. ℔. oz.
Queſt. 2. In 50 : 2 : 15 : 9 how many Ounces?
4

202

28

1621
405

5671
16

34035
5671

Facit 90745 Ounces.

By this you ſee, That if 50 C. 2 *qr.* 15 ℔. 9 *oz.* be multiplied according to the Directions given in the 7th Rule of this Chapter, the Product will be 90745 Ounces, which is the Reverſe or Proof of the ſecond Queſtion oppoſite to this on the Right-hand.

Queſt. 1. *In* 214131 *Pound Weight how many Tuns?*
28) 181
133
4) 7647 211
2|0) 191 3/4 15 *Pounds.*

Proof 95 : 11 : 3 : 15. By this you ſee, That if 214131 Pound Weight be *divided* by 28, by 4, and 20, it will produce 25 *Tun.* 11 C. 3 *qrs.* 15 ℔. which is the Reverſe of the firſt Queſtion on the Left-hand.

Queſt. 2. *In* 90745 *Ounces, how many Hundred* (*Weight?*
16) 107
114
28) 5671 25
71
4) 242 9
15 *Ounces.*
50 : 2 : 15 9 Proof.

ʒ. *pw. gr.*
Queſt. 3. *In* 50 : 10 : 11 *how many Grains of* (*Silver?*
Troy Weight
20
1010
24
4041
2021
Facit 24251 *Grains of Silver.*

Queſt. 4. *In* 507---10---11 *how many Grains of* (*Silver?*
Troy Weight
20
10150 *Penny Weight.*
24
40601
20301
Facit 243611 *Grains.*

Tun. hh. gall.
Queſt. 5 *In* 54---2---25 *how many Quarts of Wine?*
Liquid Meaſure } 4
218 *hhead.*
63
659
1310
13759 *gallons.*
4
Proof 55036 *quarts.*

Laſt. qr. buſh. gall.
Queſt. 6. *In* 75---5---3---2 *how many Gallons of Wheat?*
Dry Meaſure } 10
755 *quarters.*
8
6043 *buſhels.*
Facit 48346 *gallons.*

Queſt. 7. *In* 243611 *Grains, how many Ounces of Silver?*
24) 36
121
2|0)1015|0
11
Proof 507 : 10 : *p. w.* 11 *Grains.*

Queſt. 4. *In* 55036 *Quarts, how many Tuns of (Wine?*
4) ———
63) 13739
——— 115
4) 218 . 529
54 . 25 *Gall.*
Facit. 54 2 *hh.* 25 *Gall.*

Queſt. 5. *In* 48346 *Gallons, how many Laſts of (Wheat?*
8)
8) 6043 : 2
———
1|0) 75|5 : 3
———
Proof 75 : 5 : 3 : 2

By the foregoing Examples, the Learner may be ſufficiently inſtructed in the working and proving any Sum in *Reduction.* I ſhall forbear to give you any more Examples of this Nature, my Deſign being to improve the remaining Paper with Matter more uſeful, after I have given three or four more Examples in *Cloth Meaſure,* and *Reduction of Time.*

Cloth Meaſure.

Queſt. 6. *In* 207 *Ells,* 2 *Quarters,* 2 *Nails, how (many Nails?*
5
———
1037 *quarters.*
4
———
Fa. 4150 *Nails.*

Queſt. 7. *In* 107 *Yards*, 3 *Quarters*, 1 *Nail*, *how many Nails?*
4
―――
341 *Quarters.*
4
―――
An. 1725 *Nails.*

Queſt. 8. *In* 312 *Ells* Flemiſh, 2 *Quarters*, *how many Quarters?*
3
―――
938 *Quarters*,

Queſt. 9. *In* 112 *Aulns*, 1 *Quarter* 2 *Nails*, *how many Nails?*
6
―――
673 *Quarters.*
4
―――
An. 2694 *Nails.*

Long

Long *Meaſure:*

Queſt. 10. *The Circumference of the Earth being* 360 *Degrees, and every Degree* 60 Engliſh *Miles, I demand how many Miles, Furlongs, Perches, Inches, and Barley-Corns will reach round the World?*

360 *Degrees.*
60 *Miles a Degree.*

216000 *Miles about the Earth.*
8

172800 *Furlongs about the Earth.*
40 *Perches in a Mile.*

6912000 *Perches about the Earth.*
33 *Half Feet in a Perch.*

20736000
20736000

228096000 *Half Feet about the Earth.*
6 *Inches in a half Foot.*

1368576000 *Inches.*
3 *Barley Corns in an Inch.*

4105728000 *Barley-Corns about the Earth.*

Queſt. 11. *I demand how many oy Days, Hours, and Minutes it is ſince the Birth of our* Saviour Jeſus Chriſt, *to this preſent Year* 1720.

1723 *Years.*
365 *Days in one Year.*

8615
10338
5169

628895 *Days ſince the Birth of Chriſt.*
24 *Hours in one Day.*

2515580
1257790

15093480
10338 *Hours added, to be added.*

15103818 *Hours ſince the Birth of Chriſt.*
60 *Minutes in an Hour.*

906229080 *Minutes ſince the Birth of Chriſt.*

1723
6

10338 *Hours.*

Note, That 6 Hours is loſt in every Year; to con-ect which, you multiply the Number of Years to e reduced by 6, and the Product will give you the Hours to be added to the given Time, as you may ee in the *Example* above.

REDUCTION (according to the firſt Rule f this Chapter) teache you alſo to reduce the *ains, Weights*, and *Meaſures* of one Country into the *oins, Weights*, and *Meaſures*, of any other Country. As for Example:

Queſt. 1. *I have bought* 3507 *Ells* Flemiſh *of Genting Cloth, I would know how many Ells* Engliſh *is contained therein?*

The moſt Practical way to work this, is to multiply the Ells *Flemiſh* by 6, and divided by 10, which contracts the Work, becauſe to divide by 10, is only to cut off the laſt Figure of the Dividend. And the Reaſon is this, there are 6 half quarters of a Yard in an Ell *Flemiſh*: And there are 10 half quarters of a Yard in an Ell *Engliſh*: The Work ſtands, *viz.*

3507 *Ells Engliſh.*
6 *Fac.* 2104 $\frac{2}{10}$, *which is equal to* $\frac{1}{5}$ *the Quarter of an Ell* Engliſh.

2104|2

Queſt. 2. *In* 4215 $\frac{1}{2}$ *Ells* Flemiſh *how many Ells* (Engliſh?
6
Ells Engliſh.
2529|3 *fa.* 2529 *and* $\frac{3}{10}$, *or three half quarters.*

Queſt. 3. *In* 295 *Ells* Engliſh *how many* Portugal (*Veres of* 15 *Nails*?
20

15) 5900
140
393 50
Veres.
5 *fac.* 393 $\frac{5}{15}$.

Queſt. 4 *In* 205 *Piſtoles, at* 17 s : 6 d. *how many Pounds* (*Sterling*?
210 12

2050 210
410

24|0) 4305|0 *Pence in all the Piſtoles.*
90
179 225

9 *fac.* 179 *l. and* 90 *Pence.*

Queſt. 5

uest. 5. *In an Ingot of Silver, Quantity* 24 ℔. 7 oz. *How many Salvers, Quantity* 12 oz. ½ ?

℔. oz.
24 7
12 12 ½
——— ———
294 25
2
———
25) 590 *half Ounces.*
— 90
23 —
15 *fac.* 23 *Salvers, and* 15 *half Ounces.*

uest. 6. *In* 142 C. 3 qrs. 19 ℔ *of Sugar, How many Boxes of* 84 ℔ ?
4
———
571
28
———
4577
1143
———
84) 16007 *Pound Weight.*
— 706
190 —
Boxes. ℔
47 *fac.* 190 *and* 47 *of Sugar.*

Queſt 7. *In* 35 l. 11 s. 4 d. *how many Dollars at* (4 s. 6 d.

```
              35                          (4 s. 6 d.
              20                           12
          ──────                           ──
             711                           24
              12
          ──────
     54)    8536
     ───     313
     158     436
     ───   ─────
               4
```

Fac. 158 *Dollars and* 4 *Pence.*

Queſt. 8. *In* 75 *Hogſheads of Wine, how many Rundlets* (*of* 22 *Gallons* ?

```
              75
              63
          ──────
             225
            450
        ────────
     22)    4725
     ───      32
     214     105
           ─────
              17
```

Rundl.

Fac. 214 *and* 17 *Gallons.*

Queſt. 9. *In* 905 *Guineas, at* 21 s. 10 d. $\frac{5}{8}$ *how many Piſtoles at* 17 s. 6 d.

```
                    s.     d.            s.   d.
            905 ────21  :  10 5/8 ───── 17 :  6
           2101     12                  12
           ────    ───                 ───
            905    262                 210
           9050      8                   8
          1810     ───                ────
  ──────── ────    2101                1680
    168|0  190140|5
    ─────────  221
    1131       534
                300
             ──────
              1325
```

Piſtoles.

Fac. 11311 *and* 1325 *half* Farth

Queſt. 10. *Bought at* Bourdeaux 10 *Pieces of Pruens, Quantity* 95 *Quintals, I demand how many* C. *Weight it makes in* London?

95 *Note,* 100 ℔. *is a Quintal.*
100

112) 9500
540
84
C. ℔.
92 *Fac.* 84—92 *in* London.

Queſt. 11. *A Merchant at* London *receives an Invoyce from his Correſpondent at* Jamaica *of ſeveral Hogſheads of Sugar, Quantity* 195 C. 1 q. 16 ℔: *at* Jamaica, *I demand what Weight they produce at* London?

C. *qrs.* ℔.
195—1—16
4

781
25

3911
1563

112) 19541
834
174 501

Fac. 174—53 *in* London.

CHAP. VII.

The Golden Rule; or, *Rule of Three Direct.*

I. THE *Rule of Three* is ſo called, becauſe i
it there are always *Three Numbers* given t
find out a *Fourth*. It is alſo called the *Golden Ru*
for its excellent Performances in the Art of Numbers.

II. The *Rule of Three* is either *Single* or *Compound*.

III. The *Single Rule of Three* is either *Direct*,
Inverſe.

IV. The *Single Rule of Three Direct*, is when the
are *Three Numbers* given to find out a *Fourth* in a direct Proportion; that is, when the *Fourth* Numb
ought to bear ſuch Proportion to the *Third* as t
Second doth to the *Firſt*; Or, as the *Firſt* is in proportion to the *Second*, ſo is the *Third* to the *Fourth*. Th
is called a *Direct Proportion*.

V. In the *Single Rule of Three*, the two firſt of t
given Numbers imply a Suppoſition, and the thi
a Demand.

VI. The *Three given Numbers* muſt be ranked
ſuch Order, as that the Number to which the Demand is affixed, may poſſeſs the *Third* place, and th
Number in the Suppoſition, that is of the ſam
Name, Kind, or Quality with that in the *Third* pla
muſt poſſeſs the *Firſt* place, and the other Numb
in the Suppoſition muſt poſſeſs the *Second* place, a
is evermore of the ſame Name, Kind, or Quali
with the Number ſought.

Example. *If* 18 *Yards of Camblet coſt* 72 *s. wh*
will 596 *Yards coſt at that Rate?*

In this Example the Suppoſition is this, *viz.* If 18 Yards coſt 72 Shillings. And in the other Number (596) is implied a Demand, *viz.* What will 596 Yards coſt? Therefore muſt 596 Yards be the third Number, and that Number in the Suppoſition which is of the ſame Kind with 596 muſt be the firſt Number, which here is 18, becauſe that ſignifieth Yards as well as the third Number; and the other Number in the Suppoſition, which here is 72, is the ſecond Number, and is of the ſame kind with the fourth Number, or Number ſought; for the Number ſought by the Queſtion is the Price of 596 Yards, and the ſecond Number is the Price of the *firſt, viz.* 72 Shillings. Now the given Number being duly ſtated and ranked according to the foregoing Directions, will ſtand thus,

yrds.		*s.*		*yrds,*
18	————	72	————	596

VII. *In the Single Rule of Three Direct, if you Multiply the Second Number by the Third, or (which is all one) the Third Number by the Second, and divide the Product thereof by the firſt, the Quotient thence ariſing is the fourth Proportional Number ſought, or Anſwer to the Queſtion.* As in the foregoing Example, *viz.* If 18 Yards of Camblet coſt 72 Shillings, what will 596 Yards coſt at that Rate? The Number given in the Queſtion being ranked according to the Directions given in the ſixth Rule, multiply the ſecond Number (72) by (596) the third Number, and the Product is 42912, which being divided by (18) the firſt Number, the Quotient is 2384, which is the fourth Number or Anſwer to the Queſtion. See the whole Opperation as followeth, *viz.*

```
yrds.            s.               yrds.
 18 give ——————— 72 ——————— what will 596
                                       72
                                     ————
                                     1192
                                    4172
                                    —————
                             18) 42912 ſhill.
                             ————    69
                      fa 3484        151
                        ſhill.        72
                                    ————
                                       0
```

VIII. When (according to the foregoing Directions) you have found out the *Anſwer* to the *Queſtion*, you are always to eſteem it of the ſame Name that your *ſecond* Number was of, or reduced to. So here in the foregoing Example, the *Anſwer* to the *Queſtion* is 2384 *Shillings*, becauſe the *ſecond* Number is 72 *Shillings*. And if the *ſecond* Number had been reduced into *Pence*, it makes 864, and then the *Anſwer* would have been 28608 *Pence*, as by the following Operation appears.

```
yrds.            s.                      yrds
 18 give ——————— 72 ————————— what-will  59
                 12                      86
                ————                    ———
                 86                      238
                                        3576
                                       4768
                                       —————
                              18) 51494
                        ——————————  154
                        fa. 28608   109
                                      14
                                     ———
```

Fac. 28608 Pence equal to 2384 Shillings.

Likewiſ

Likewiſe if the ſecond Number had been reduced into *Farthings*, it would have been 3456, which being multiplied by (596) the third Number, the Product is 2059776, which being divided by (18) the firſt Number, the Quotient is 114432 *Farthings*, equal to 119 *l.* 4 *s.* as before, which you may prove at your Leiſure.

IX. When the ſecond Number conſiſteth of divers Denominations; as, of *Pounds* and *Shillings*, or of *Pounds*, *Shillings* and *Pence*, then you muſt reduce it o the loweſt Name mentioned, or lower if you leaſe, and then multiply the ſecond by the third, nd divide the Product by the firſt, *&c.* as before directed.

Example.

If 26 Yards of Broad Cloath coſt 12 l. *02* s. *08* d. *What will 248 Yards of the ſame coſt at that Rate?*

The given Numbers in the *Example* being ranked ccording to the Directions give in the Sixth Rule foregoing, will ſtand thus:

yds.	*l.*	*s.*	*d.*	*yds.*
26 ——	12 ——	02 ——	08 ——	248

Hence the ſecond Number conſiſteth of divers Denominations, *viz.* *Pounds*, *Shillings* and *Pence*, erefore muſt it be reduced to the loweſt Name entioned, which is *Pence*, and it makes 2912, which ing multiplied by (248) the third Number, the oduct is 722176, which being divided by (26) e firſt Number, the Quotient is 27776 *Pence*, beaſe the ſecond Number was reduced into *Pence*, hich is the Anſwer to the Queſtion, and may be duced to 115 *l.* 14 *s.* 08 *d.* As you may ſee by e following Operation.

```
yrds.            l.   s.   d.             yrds.
 20 ——— give 12——02——08 ——— what 248
             20
            ———
            242
             12
            ———
           2912
            248
            ———
          23296
          11648
          5824
          ————
   26)    722167
   ——      202
12) 2776 d. 201
    ———     197
2|0) 231|4 : 8  156
    ————    ———
  115 : 14 : 8   0

      l.   s.  d.
fa. 115 : 14 : 08
```

X. If the *Firſt* and *Third* Numbers, or either o them, conſiſts of divers Denominations, then mu they be both reduced to the loweſt Denomi nation mentioned in either of them, as if th *Firſt* Number be Hundred Weights only, and th *Third* be Hundreds, Quarters, and Pounds, the muſt they be both reduced into Pounds, becau Pounds are mentioned in the *Third* Number. O if the *Firſt* and *Third* Numbers being of one kin are notwithſtanding of different Denomination then muſt they be reduced to one Denominatio s if the *firſt* be Pounds of Weight, and the *third* be Hundred Weights, then muſt the *third* Number be reduced to Pounds as is the *firſt*.

Example III.

If 1 C. *Weight of Tobacco coſt* 4 l. 5 s. 2 d. *what will* 34 C. 3 qrs. 18 ℔. *coſt at that Rate ?*

In this Example, becauſe the *third* Number has *ounds* mentioned therein, therefore muſt the *firſt* nd *third* Numbers be both reduced to *pounds*, and he *ſecond* Number, which is 4 *l.* 5 *s.* 02 *d.* muſt e reduced into *pence* by the Fifth Rule of Chap. V. nd then the *ſecond* Number being multiplied by the *hird*, the Product is 3996020, which being divided y the *firſt*, the Quotient is 35678 *pence*, which is qual to 248 *l.* 13 *s.* 02 *d.* and 84 remaineth: and ow that or any other ſuch like Remainder may be rdered ſhall be taught by and by. See the followng Operation.

```
℔.         l.  s.  d.           C.  qr. ℔.
112  coſt  4—5—2———————34---3---18
           20                    4
           ——                  ———
           85                  139
           12                   28
         ——————              —————
         1022 Pence.          1120
                               279
                              ————
                              3910
                              1022
                             —————
                              7820
                             7820
                           39100
                          ———————
           112)           3996020
         ————————          636
     12) 35678             760
        ————————           882
     297|3 : 2 d.  980     84
    ——— ————————  —————   ———
Facit 148 : 13 : 2 84/112  84   42
```

Example.

If 14 ℔. *of Sugar coſt* 5 s. 3 d. *what will* 46 C *Weight coſt at that Rate?*

In this Example the *third* Number muſt be red ced into *Pounds*, becauſe the firſt Number is Pounds and it makes 5152, and the ſecond Number m be reduced into Pence, making 63, then the ſecon Number being multiplied by the third, the Pr duct is 324576) which being divided by (14) t fi ſt Number, the Quotient is 23184 Pence, for the nſwer; which is equal to 96 *l.* 12 *s.* as by the folowing Operation appears.

℔. *s.* *d.* C.

4 —— —— Sugar 5 —— 3 —— . —— 46

12 112

———

92

506

———

5152

63

———

11456

30912

———

14) 324576

3) 23184 —— 44

——— 25

139'2 117

——— 56

———

Facit 96 *l.* 12 *s.* 0 *d.*

XI. When you have multiplied the ſecond Numer by the third, and divided the Product thereof by he firſt, if any thing remain after Diviſion is ended, t is part of an Unit in the Quotient, and its Value nay be found out thus, *viz.*

Multiply the ſaid Remainder by the Parts of he next inferiour Denomination that are equal to n Unit of the Quotient, and divide that Product y the firſt Number, ſo ſhall the Quotient be he Value of the ſaid Remainder in the ſaid Parts, nd if any thing yet remain, multiply it by the arts of the next inferiour Denomination, that are qual to an Unit of the laſt Quotient, and divide the Product by the ſaid Number, *&c.* Proceed thus till you have brought it as low as you deſire: And if any thing remain at laſt of all, it is the part of an Unit of the leaſt Denomination, into which you reduce the ſaid Remainder, and muſt be placed according to the Direction given in the Fourth Rule of the Fifth Chapter.

In the third Example foregoing, after the Diviſion is ended, there is a Remainder of 84, which ſheweth that the Anſwer to the Queſtion is not exactly 35678 Pence, or 148 *l.* 13 *s.* 02 *d.* as it is there found, but it is ſomething more; therefore to find the value of this Remaindet 84, I multiply it by 4, (becauſe 35678 the ſaid Quotient is Pence) and the Product is 336, which I divide by the firſt Number 112, and the Quotient is 3 Farthings, without any other Remainder, and ſo is the true Anſwer to that Queſtion 148 l. 13 s. 02 d. ¾. Mind the Operation of the next Example.

Example

Example V.

If 1 C. *Weight of Currans coſt* 2 l. 14 s. *what will* C. 3 qrs 16 ℔ *coſt at that Rate?*

```
℔      l.     s.                C.   qrs.   ℔.
112 —— 2 —— 14                  24 —— 3 —— 16
      20                         4
     ————                        —
      54                        99
                                28
                               798
                               ———
                               199
                               ———
                              2788
                                54
                             ——————
                             11152
                             13940
                             ——————
              112)          150552
             ——————           385
        ſhill.  1344          495
             ——————           472
Facit   pence     2            ———
             ——————            24
        farth.    2            12
                               ———
                               288
                               ———
                                64
                                 4
                               ———
                               262
                                 3
```

In the Work of the foregoing Example, you may obſerve that the ſecond Number is reduced no lower than Shillings, making 54; therefore the Quotient is 1344 Shillings, equal to 67 *l.* 4 *s.* and there is a Remainder of 24: Therefore, to find out how many Pence is contained therein, I multiply it by 12, and the Product is 88, which being divided by 112, (becauſe that is the firſt Number) the Quotient is 2 Pence, and there is a Remainder of 64, which I multiply by 4, (to find its Value in Farthings) and the Product is 256 which I divide again by 112, and the Quotient is 2 Farthings, and there is a Remainder of 32, which, according to the fourth Rule of Chapter VI. is $\frac{32}{112}$ of a Farthing; and so the Anſwer to the Queſtion 67 *l.* 4 *s.* 2 *d.* 2 *qrs.* $\frac{32}{112}$. The like may be obſerved of any other.

Example VI.

If 24 *Yards of Camblet coſt* 4 l. 16 *s.* *I demand how many Yards I may buy for* 126 l. *Facit* 360 Yards. The Terms being ranked as is directed in the Sixth Rule of this Chapter, will ſtand thus, *viz.*

```
l.   s.          yrds.        l.
4 —— 16 ———————— 24 ———————— 126
20                            20
——                          ——————
96                           2520
                               24
                            ——————
                            10080
                            5040
                            ——————
                     96)    60488
                     ——       288
                     630     ————
                               00
```

Having thus demonſtrated the Reaſon of the *Single Rule of Three Direct* in the Six foregoing *Examples*, I ſhall proceed now to propoſe ſeveral Queſtions ns in the *Rule of Three* for the Learner's Practice, and nly ſet down their *Facits*, as a further Help to them the working of their Queſtions.

Queſtion 1. If an Ounce of Silver coſt 5 s. 4 d. hat will 46 *oz.* 15 *pw.* 12 *gr.* coſt? *Facit* 12 l. 09 s. d. $\frac{288}{486}$.

Queſt. 2. If 12 Yards of Broad-cloth coſt 7 l. 6 s. demand how much I ought to give for 26 Pieces, ch Piece containing 27 Yards? *Facit* 427 l. 1 s.

Queſt. 3. If 18 Yards of *Cambrick* coſt 4 l. 13 s. I emand the Price of 73 Pieces, each Piece containg 34 Ells *Flemiſh*? The Ell *Flemiſh* being 3 quarters a Yard? *Facit* 480 l. 17 s. 9 d.

Queſt. 4. If 17 C. 3 qrs. 17 ℔. of Tobacco ſt 145 l. 12 s. I demand how much the Ounce nds me in at that Rate? *Facit* 1 d. $\frac{2664}{32080}$ *per* unce.

Queſt 5. If 112 ℔. of Lead coſt 15 s. 11 d. I demand the Price of 54 Fother, each being 19 C. $\frac{1}{2}$? cit 838 l. 0 s. 3 d.

Queſt. 6 When 7 ℔. of Tobacco coſt 5 s. 9 d. $\frac{1}{2}$, hat will 30 C. weight coſt? *Facit* 139 l.

Queſt. 7. When the Tun of Wine coſt 51 l. 14 s. hat coſt the Quart at that Rate? *Facit* 12 *d.* $\frac{1}{4}$

Queſt. 8. At a Noble *per* Week, how many Months oard may I demand for 50 l? *Facit* 22 Months and Weeks.

Queſt. 9. A Grocer bought 30 Frails of Raiſins, ch Frail weighing 91 ℔ weight, at 18 s. 8 d. *per* . I demand how much they amount to? *Facit* l. 15 s.

Queſt. 10. What comes the Commiſſion of 462 l. s. 0 d. to, at 3 $\frac{1}{2}$ *per Cent.*? *Facit* 22 l. 9 s 9 d.

Queſt. 11. What comes the Inſurance of 375 l. s. 4 d. to, at 3 Guinea's *per Cent.* the Guinea's at s. 9 d. $\frac{5}{8}$? *Facit* 12 l. 5 s. 6 d.

Queſt. 12. A Corn Factor bought 248 Quarters of Wheat for 511 *l.* 06 *s.* 04 *d.* for 100 Quarters of which he gave 33 *s.* 04 *d.* *per* Quarter, I demand how much he gave *per* Quarter for the Remainder? *facit* 2 *l.* 6 *s.* 6 *d.*

Queſt. 13. If a Piece of Cloth coſt 31 *l.* 5 *s.* I demand how many Yards were in the ſame, the Yard being valued at 12 *s.* 6 *d.* *facit* 34 Yards.

Queſt. 14. If a Piece of Cloth coſt 24 *l.* 5 *s.* 4 *d.* I demand how many Yards were contained in the ſame, when the Ell Engliſh is worth 17 *s.* 4 *d.*? *facit* 35 Yards.

Queſt. 15. Bought 124 Pieces of Camblet for the Sum of 987 *l.* 14 *s.* 8 *d.* at 4 *s.* 8 *d.* *per* Yard, I demand how many Yards there were in all, and how many Ells *Flemiſh* there were in a Piece? *facit* 4233 Yards, and 45 ½ Ells *Flemiſh per* Piece.

Queſt. 16. A Gentleman hath an Eſtate of 1224 *l.* *per Annum*, and his Expences one Day with another amount to 1 *l.* 13 *s.* 4 *d.* I demand how much he layeth up at the Year's end to purchaſe with? *facit* 615 *l.* 13 *s.* 4 *d.*

Queſt. 17. A Gentleman expendeth one Day with another 43 *s.* 6 *d.* ½. and at the Year's end layeth up 850 *l.* I demand his Annual Eſtate? *facit* 1644 *l.* 12 *s.* 8 *d.* ½ *per Annum.*

Queſt. 18. Bought 3 Hogſheads of Nutmegs, *viz.* at 5 *s.* 7 *d.* the Ounce, I demand the Neat coſt thereof?

N°. 1

```
           C.     qr.    ℔.
N°. 1 —— 3 ——— 2 ——— 21
    2 —— 4 ——— 1 ——— 14
    3 —— 4 ——— 2 ——— 18
    ————————————   ————
        12 ——— 2 ——— 25
                4
            ————
               50
               28
            ————
              405
              102
            —————
             1425
               16
            —————
             8550
            1425
           ——————
            22800 at 5 s. 7 d. F. 6365 l.
```

Queſt. 19. A Merchant conſigns to his Factor in *Spain* 188 Cloths, with Commiſſion for Sale at 23 *l.* 2 *s.* 2 *d. per* Cloth, and to make Returns from thence, the one half in Wines at 28 *l. per Tun,* and the other half in Sugar at 27 *s. per* C. *Weight,* I demand how much of each ought to be returned for the Cloths?

Anſwer. The whole Value of the Cloth is 4344 *l.* 7 *s.* 4 *d.* the half whereof is 2172 *l.* 2 *s.* 8 *d.* which will buy 77 $\frac{3854}{6720}$ Tuns of Wine at 28 *l. per Tun,* and the other half will buy 1609 $\frac{8}{324}$ Hundred Weight of Sugar.

Queſt 20. If 100 *l.* in 12 Months gain 6 *l.* Intereſt, what will be the Intereſt of 806 *l.* for the ſame time? *Facit* 53 *l.* 15 *s.* 2 *d.* $\frac{40}{45}$.

Queſt. 21. An Uſurer putteth out 889 *l.* to Intereſt, and at the end of 12 Months he receives for Principal and Intereſt 932 *l.* 16 *s.* I demand at what Rate *per Cent. per Annum* he received Intereſt? *Facit* 6 *per Cent.*

Queſt. 22. I demand what Principal in 12 Months will gain 64 *l.* 10 *s.* at the Rate of 6 *per Cent.*? *Facit* 1075 *l.*

Queſt. 23. An Orphan is indebted to his Guardian 51 *l.* and the Guardian having in his Hands 180 *l.* of the Orphan's, it is agreed between them, that the Guardian ſhall keep the ſame in his Hands 'till the ſaid 51 l. be paid by the Intereſt thereof at 6 *per Cent. per Annum.* Now I demand how long he ought to keep the ſame at that Rate? *Facit* 8 Years and 6 Months.

Gain and Loſs

Queſt. 24. A Draper buys 2795 ½ Ells *Flemiſh* of Genting, at 22 *d.* ½ the Ells *Engliſh.* It is required to know at what Price the Cloth muſt be ſold out to gain 15 *l.* 10 *s. per Cent.*? Firſt find the Price it coſt by the Rule of Three, 157 *l.* 4 *s.* 11 *d.*, Then ſay, if 100 *l.* give 15 *l.* 10 *s.* what will 157 *l.* 4 *s.* 11 *d.*? *Facit* 24 : 7 : 5, which add to 157 : : 4 : 11, makes 181 : 12 : 4 Or if 100 ℔ give 115 : 0, what will 157 : 4 : 11? *Facit* 18 : 12 : 4 which is anſwered at one Operation.

Loſs and Gain.

Queſt. 25. If the aforeſaid Cloth were to be ſold, ſo as to loſe 15 *l* 10 *s. per Cent.* Firſt ſubtract 15 *l.* 10 *s.* out of a 100 *l. facit* 84 *l.* 10 *s.* Then ſay If 100 *l.* fall to 84 *l* 10 *s.* what ſhall 157 *l.* 14 *s.* 11 *d*? *facit* 132 *l.* 17 *s* 6 *d.*

Fellowſhip.

Queſt. 26 Three Merchants Company; *A.* his Stock was 175 *l.* 12 *s.* *B*'s 215 *l.* 19 *s.* 4 *d.* C's 150 *l.* 11 *s.* 9 *d.* they have gained together 209 *l.*

11 *s.* 4 *d.* I demand each Man's Part of *the ſaid Gain?* *Firſt add the ſeveral Stocks into one Total*, which makes 541 l. 3 s. 1 d. then make Three ſeveral Queſtions in the *Rule of Three, viz.*

l. s. d. l. s. d. l. s. d.
If 541 : 3 : 1 give 209 : 11 : 4 what 175 : 12 : 4 *A*
If 541 : 3 : 1 give 209 : 11 : 4 what 214 : 19 : 4 *B*
If 541 : 3 : 1 give 209 : 11 : 4 what 150 : 11 : 9 C

Facit

Add all the *Facits* together, if it make up the *Money* to be *divided*, your *Sum* is true. If you have any Remains on the Diviſions, add them up into one Total, which divide by the common Diviſor, and the Quotient add to the loweſt Denomination.

Fellowſhip with Time.

Queſt. 27. Three Merchants Company. *A*, his Stock was 109 l. 5 s. for 3 Months. *B*'s 450 l. 7 s. for 4 Months. *C*'s 147 l. 12 s. for 6 Months, they have gained 209 l. 7 s. 2 d. I demand each Man's Part?

This is worked as the laſt precedent Queſtion, only each Man's Stock is multiplied by the time, *viz.*

A 109—05 *B* 450—7 C 147—12
3 mo. 4 mo. 6 mo.

A 327—15 *B* 1801—8 C 885—12
B 1801—08
C 885—12

l. s. d. l. s.
If 3014 : 15 gain 209 : 7 : 2 what will 327 : 15 *A*
If 3014 : 15 gain 309 : 7 : 2 what will 1801 : 08 *B*
If 3014 : 15 gain 209 : 7 : 2 what will 885 : 12 C

Facit.

Add all the *Facits* together, and if it make the given Sum 209 l. 7 s. 2 d. your Work is true, otherwiſe falſe.

The Proof of the Single Rule of Three Direct.

To prove a Queſtion in the *Single Rule of Three Direct*; multiply the fourth Number (or Anſwer to the Queſtion) by the firſt, and if the Product thereof be equal to the Product of the ſecond and third, then is the Operation truly performed, otherwiſe not; as in the firſt *Example* of this Chapter, *viz.*

If 18 Yards coſt 72 Shillings, what will 596 Yards coſt at that Rate? The Anſwer there found is 28608 Pence, which is the fourth Number. Now the Product of the firſt and fourth, *viz.* 28608 by 18 is 514944, which is equal to the Product of the ſecond and third, *viz.* 864 by 596, as you may ſee by the following Operation, where the ſecond Number, *viz.* 72 Shillings is reduced into 864 Pence.

yrds.	*d.*	*yrds.*	*d*
18	864	596	28608
	596		18
	1184		228864
	7776		28608
	4320		514944
	514944		

And here Note, That if any Thing remain after Diviſion is ended, it muſt be added to the Product of the firſt and fourth Numbers; and then muſt that Sum be equal to the Product of the ſecond and third. As in the third *Example* of this Chapter, which is, If 1 C. Weight of Tobacco coſt 4 *l.* 15. 2 *d.* what will 34 C. 3 *qrs.* 18 ℔ coſt?

The 3 given Numbers being reduced, are 112 l. 1022 d. and 3910 l. and the fourth Number or Anſwer to the Queſtion is there found to be 35678 d. and the Remainder is 84; the Product of the ſecond and third is 3996020 ; and the Product of the firſt and fourth is 3995936, to which adding the Remainder, the Sum is 3996020, equal to the Product of the ſecond and third, which proves the Work to be true.

```
 l.          d.          l.          d.
112 ——————— 1022 ——————— 3910 ——————— 35678
                         1022          112
                        ——————       ——————
                         7820         71356
                        7820         35678
                       39100        35678
                       ———————      ————————
                       3996020      3995936
                       remains  add      84
                                    3996020
```

CHAP. VIII.

The Single Rule of Three Inverſe.

I. THE *Single Rule of Three Inverſe*, is when the the fourth Number, or Number ſought, ought to bear ſuch Proportion to the firſt, as the ſecond doth to the third.

II. When a Queſtion in the *Single Rule of Three* is ſtated, conſider whether the fourth Number (or Anſwer to the Queſtion) ought to be more or leſs than the ſecond Number, which upon a little Conſideration you may diſcover. If it ought to be more than the ſecond, then muſt the leſſer Extream be the Diviſor, and if it ought to be leſſer than the ſecond, then muſt the biggeſt of the Extreams be the Diviſor, (in this Caſe the firſt and third Numbers are called Extreams) and if it fall out that the third Number is the Diviſor, that Queſtion is ſaid to be of *The Single Rule of Three Inverſe*: As in the following Examples.

Example I.

If 30 *Men can build a Wall in* 32 *days, I demand in how many days* 60 *Men may do the ſame?*

The given Numbers being ranked according to the ſixth Rule of the ſeventh Chapter, will ſtand as followeth:

Men *Days* *Men*
30————.————32————————60

Then I conſider whether 60 Men will do it in more or leſs days than 42, and find that they will require leſs time than 32 days (for the more the Men, the leſſer the Time) wherefore 60, which is the biggeſt Extream, muſt be the Diviſor, and the firſt and third muſt be multiplied together, and their Product, which is 960, being divided by the third Number 60, the Quotient is 16 Days, and in ſo long time will 60 Men finiſh the ſaid Work. See the following Operation.

Men *Days* *Men*
30 —— 32 —— 60
30
————————
6|0) 96|0
————————
Fac. 16 *Days*.

Example II

If 100 l. in 12 Months gain 10 l. for the Intereſt
ereof, I demand what Principal will gain the ſame
tereſt in 8 Months?

Here it being required what Principal will gain
0 *l.* in 8 Months, therefore muſt 100 *l.* Principal
e the ſecond Number, according to the Directions
n the Sixth Rule in the Seventh Chapter, and the
umbers being ranked accordingly, will ſtand thus:

Mon.	*l.*	*Mon.*
12 ——	—— 100 ——	—— 8

Here I conſider, that the ſhorter the Time, the
ore muſt be the Principal to gain the ſame Inte-
ſt; wherefore the leſſer Extream muſt be the Divi-
r, which here is (8) the third Number, therefore
e firſt and ſecond, *viz.* 12 and 100 muſt be multi-
lied the one by the other, and the Product is 1200,
hich being divided by (8) the third Number, the
Quotient is 150 *l.* and ſo much will gain 10 *l.* Inte-
eſt in 8 Months at 10 *per Cent. per Annum*: See the
llowing Work.

12 —— —— 100 —— —— 8
12

8) 1200

Facit 150

Example III.

Lent my Friend 120 l. *for* 6 *Months, he promiſing to*
me the like Courteſie another time; and not long after
had occaſion for a Sum of Money for 9 *Months, I de-*
and how much he ought to lend me for that time, to
taliate my former Kindneſs?

Facit 80 *l.* The longer the Time, the Leſſer ought the Sum of Money to be.

Example IV.

A Footman performs a Journey in 12 *Days, when the Day is* 15 *Hours long, I demand in how many Days he may perform the ſame when the Day is* 10 *Hours long?*

Facit 18 Days. The ſhorter the Days, the more Days will the Journey require.

Example V.

How many Yards of Matting, that is half Yard wide, is enough to cover a Floor that is 16 *Foot wide, and* 28 *Foot long?*

Facit $298\frac{2}{3}$ Yards of Matting.

Example VI.

Suppoſe that (according to the Statute) when the Buſhel of Wheat coſt 4 s. *the Penny-Loaf ought to weigh Nine Ounces, I demand what the Price of the Buſhel ought to be, when the Penny-Loaf weigheth* 12 *Ounces?*

Facit 3 s. per Buſhel.

Example VII.

If when the Tun of Wine coſt 45 l. *a certain Quantity worth* 25 s. *is ſufficient for the Accommodation of* 20 *Men, I demand how many Men the ſame* 25 s. *worth will ſuffice when the Tun is worth* 30 l.?

Facit 30 Men; for the cheaper the Wine, the more may be bought for the ſame Money.

Example VIII.

If when the Tun of Wine coſt 45 l. *a Quantity worth* 50 s. *it enough for the Entertainment of* 40 *Men, I demand the Price of the Tun when* 50 s. *worth is enough for* 90 *Men?* *Facit* 20 l. per Tun.

Example IX.

If 60 *Ells at* London *be equal to* 100 *Ells at* Ant-erp, *and each Ell at* London *contains* 20 *Nails of an* ngliſh *Yard. I demand how many ſuch Nails the Ell of* ntwerp *contains? Facit* 12.

Example X.

If for 5 l. 3 s. 4 d. *I can have* 10 C. *Weight carried* 40 Miles, *I demand how many* Miles *I may have* 4 C. *Weight carried for the ſame Money?*
Facit 100 Miles.

The Proof of the Single Rule of Three Inverſe.

If the Product of the Fourth Term multiplied by e Third, be equal to the Product of the Second ultiplied by the Firſt, then is the Work truly per-rmed, otherwiſe not.

Let us prove the firſt Example of this Chapter, iz. *If* 30 *Men can build a Wall in* 32 *Days, I demand how many Days* 60 *Men may do the ſame?* The Anſwer there found to be 16 Days, and the Four Terms eing duly ranked, ſtand as followeth.

Men	*Days*	*Men*	*Days*
32	32	60	16
30			60
960			960

The fourth Term (16) being multiplied by (60) e third Term, is 960, which is equal to the Pro-uct of (32) the ſecond Term, by (30) the firſt.

CHAP. IX.

The Double Rule of Three Direct.

I. THE *Double Rule of Three*, is when there are Five Numbers given to find out a Sixth in proportion thereunto.

II. A Queſtion in the *Double Rule of Three* may be reſolved by Two Single Rules of Three, or by *One Rule of Three compoſed of the Five given Numbers.*

III. When a Queſtion in the *Double Rule of Thre* may be ſolved by Two Single Rules of Three Direct, that Queſtion is ſaid to belong to the Double Rule of Three Direct.

IV. Of the Five Numbers given in the *Double Rule of Three*, Three of them always imply a Suppoſition, as the other Two a Demand. As in the following Example:

If 16 *Men can reap* 96 *Acres of Wheat in* 36 *Days; I demand, How many Acres* 64 *Men may reap in* 48 *Days?*

Here the Suppoſition is, *If, or ſuppoſe* 16 *Men reap* 96 *Acres in* 36 *Days*, and the Demand is, *How many Acres* 64 *Men reap in* 48 *Days?*

V. When you would ſolve a Queſtion in the *Double Rule of Three*, the given Numbers are to be ſo ranked, that the Firſt and Third may be of one Denomination, and the Second Number muſt be of the ſame Quality, Name, or Denomination with the Numbr ſought; and Note, That the Firſt and Second Numbers muſt be always of the Suppoſition, and the Third of the Demand. So likewiſe muſt the Fourth Number be of the Suppoſition, and the Fifth of the Demand, and both of one Denomination; ſo may each Queſtion be ſolved by Two ſingle Rules of Three, two different ways.

A

s in the Queſtion foregoing, which being again peated, is as followeth.

If 16 *Men can reap* 96 *Acres of Wheat in* 36 *Days, ow many Acres may* 64 *Men reap in* 48 *Days?* The umbers being ranked according to the foregoing irections, will ſtand as followeth.

Men *Acres* *Men*
16———————96———————64
Days 36———.———.———.———48 *Days.*

Or thus,

Days *Acres* *Days*
36———————96———————48
Men 16———.———.———.———64 *Men*

VI. When a Queſtion in the *Double Rule of Three* to be ſolved at Two ſeveral Operations in the ingle Rule of Three, the Anſwer to the firſt Queion muſt be the ſecond Number in the ſecond Queion, and the fourth and fifth Numbers muſt be the irſt and third in the ſecond Queſtion.

So in the firſt Order of ranking the given Numers in the foregoing Queſtion, the three firſt Numers are 16—96—64, wherein is implied this Queſtion, *viz. If* 16 *Men can reap* 96 *Acres, How much ay* 64 *reap in the ſame time, viz. in* 36 Days? Multiply and divide according to the Directions iven in the Seventh Rule of the Seventh Chapter, nd you will find the Anſwer to be 384 Acres; ſo hat now I have found how many Acres 64 Men may eap in 36 Days; but by the Queſtion, it is required o know how much they can reap in 48 Days?

Therefore I ſay again by the Single Rule of Three, *f* 36 Days *will reap* 385 *Acres, How many may be one in* 48 *days?* Multiply and divide, and you will ind the Anſwer to the Queſtion to be 512 Acres, nd ſo many may 64 Men reap in 48 Days. if 16 Men can reap 96 Acres in 36 Days. See the whole Work as followeth.

Men

```
      Men                 Acres                  Men
      16———————.———96———————.——————64
Days  36 ———————————————————————————————— 48 Days
      16 —— 96 —— 64   |        Days   Acres   Days
                  96   |        36 —— 384 —— 48
                ————   |                    384
                       |                   ————
                 384   |
                 575   |                   3072
               ————    |                   1536
                       |                   ————
          16) 6144     |          36)     18432
          ————  134    |          ————       43
Facit 384 Acres. 64    |    Facit 512 Acres. 72
                ————   |                   ————
                   0   |                      0
```

In the ſecond ſtating of the above Work, I multiply 384 by 48 to ſave Paper; for if the two Numbers be multiplied together, it is indifferent whether the Multiplicand or Multiplier be placed uppermoſt.

Or if the Five given Numbers of the foregoing Queſtion had been ranked according to the Second Method laid down at the latter end of the Fifth Rule, the Anſwer would have been the ſame, and the Operation as followeth.

```
      Days                Acres                  Days
      36———————.———96———————.——————48
  Men 16 ———————————————————————————————— 64
   36 —— 96 —— 48   |     16 —— 128 —— 64
               96   |                 128
             ————   |                ————
              288   |                 512
              432   |                 768
          ————————  |                ————
       36) 4608     |          16)   8192
       ————  100    |          ————    19
Facit 128 Acr. 288  |   Facit 512 Acr. 32
             ————   |                ————
                0   |                   0
```

I doubt not, but that by the Operation before going, this Rule is ſufficiently illuſtrated; but for the Learners further Experience herein, I ſhall propound ſeveral other *Examples*, and only give their Anſwers, leaving the Operation to the Induſtrious Learner.

Example 1. *I demand the Intereſt of* 75 l. *for* 18 *Months, after the Rate of* 6 per Cent. per Annum?

This *Queſtion* may be more intelligibly ſtated thus, *viz. If* 100 l. *in* 12 *Months gains* 6 l. *Intereſt, What will* 75 l. *gain in* 18 *Months at that Rate? Facit* l. 15 s.

Example 2. *If* 12 *Men can reap* 48 *Acres of Wheat in* 18 *Days, I demand how many Acres* 36 *Men may reap in* 24 *Days? Facit* 192 Acres.

Example 3. *If* 3 *Quarters of Malt is ſufficient for a Family of Six Perſons for Two Months, How many Quarters is enough for a Family of* 18 *Perſons for* 12 *Months? Facit* 54 Quarters.

Example 4. *If* 8 *Reapers have* 3 l. 4 s. *for* 4 *Days Work, I demand how much* 24 *Men will have for* 16 *Days Work? Facit* 38 l. 8 s.

Example 5. *If* 336 ℔ *of Bread is ſufficient for* 56 *Men for* 12 *Dayr, I demand how much will ſerve* 460 *Men* 96 *Days? Facit* 22080 ℔ *of* Bread.

Example 6. *If* 40 *Buſhels of Oats be enough for* 8 *Horſes* 20 *Days, I demand how many Buſhels will ſerve* 48 *Horſes* 12 *Days? Facit* 144 Buſhels.

Example 7. *A Banker took in* 250 l. *to pay Intereſt for the ſame, and at the End of* 18 *Months he paid* 272 l. 2 s. *for Principal and Intereſt, I demand at what Rate* per Cent. per Annum, *he paid Intereſt.*

CHAP.

CHAP. X.

The Double Rule of Three Inverſe.

I. WHEN a Queſtion in the *Double Rule* *Three* being ſolved at Two Single Rule as is taught in the foregoing Chapter, hath one thoſe Single Rules Inverſe, (for they are never bo Inverſe) then is that Queſtion ſaid to be of th *Double Rule of Three Inverſe.*

II. A Queſtion in the *Double Rule of Three Inverſ* may be ſtated two ſeveral Ways, as well as a Que ſtion in the *Double Rule Direct*, and ſo the Inverte Propoſition may be either in the firſt or ſecond Ope ration at pleaſure.

Example 1. *If a Footman travel* 240 *Miles in* *Days, when the Day is* 10 *Hours long, I demand in ho many Days he may travel* 720 *Miles, when the Day i* 15 *hours long ?*

The given Nnmbers being ranked according t the Fifth Rule of the Ninth Chapter, will ſtand a followeth:

	Miles	*Days*	*Miles*
	240	8	720
Hours	10		15

Or thus,

	Hours	*Days*	*Hours*	
	10	8	15	
Miles	240		710	*Miles*

Here, according to the firſt manner of ranking he given Terms, the Inverted Proportion is in the econd ſingle Operation.

III. You may alſo work the Double Rule of Three, either *Direct* or *Inverſe* at one Operation, by he *Compound Rule of Five Numbers*, obſerving to ank the ſeveral Terms as is before taught in the Fifth Rule of the Ninth Chapter.

IV. And if your Queſtion be of the Double Rule f Three Direct, multiply the Three laſt Terms together for Dividend, and the two firſt for Diviſor, in the following Examples, *viz.*

If 100 l. *in* 12 *Months require* 6 l. *Intereſt, How much tereſt will* 50 l. *require in* 10 *Months?*

```
l.          mo.            l.        l.
00————————12——————————6           50
0———————— 10                     10 m.
                         100    ————————
                          12       500
                       ——————        6
Facit 2 l. 10 s. 12,00          ——————
                                 30'00
                                ——————
                                  2|10
```

V. But if your Queſtion be of the *Rule of Three verſe*, multiply the firſt, ſecond, and laſt Numbers together for Dividend, and the third and fourth, Diviſor, as in the following Example.

Example. *If* 50 l. *in* 10 *Months require* 2 l. 10
Intereſt, Of what Principal ſhall the Intereſt of 6 l. *m*
in 12 *Months?*

l. *mo.* *l.* *s.*
If 50 —— 10 —— 2 —— 10
12 —— 6

l. *s.*
2 —— 10 5
Facit 100 *l.* 12
3|0) 300
Facit 100

This laſt being a Queſtion in the Rule of Thr
Inverſe, according to the Directions given in t
Fifth Rule of this Chapter. I multiply the fir
ſecond, and laſt Numbers together for a Divide
which produces 3000. Then I multiply 2 l. 10
my third Number, by 12, my fourth Number; a
ſay 12 times 10 s. is 120, I put down a (0) a
carry 6 l. to the place of Pounds, and ſay, 12 tim
2 is 24, and 6 I carried, is 30 for my Diviſor. Th
I divide, and the Quotient is 100 l. being the Pri
cipal that is 6 l. Intereſt will make in 12 Month
which was to be proved.

But a more particular Application ſhall be ma
of the Double Rule of Three, when we come t
treat of Simple Intereſt.

CHA

CHAP. XI.

Of EXCHANGE.

HAving explained the Nature of the Rule of Three, and the manner of reſolving Queſti- ns therein, I am naturally led to treat of its parti- lar Uſe in the Exchange of Coins.

In the Exchange of Coins, it is neceſſary that the *r* or *Value* of the *Money* in each Place be exactly own: For the Word *Par* ſignifies to equalize the oney of Exchange from one *Place* with that of other *Place*. As when I take up ſo much *Money per* xchange in one *place*, to pay the juſt *value* thereof another kind of *Money*, in another *place*, without ving Reſpect to the *Price* Current of Exchange r the ſame, but only to what the Money does rrently paſs for in each place. From whence may eaſily found out the *Profit and Loſs* of all *Moneys* awn, or remitted *by Exchange*. But this *Par* being ounded principally upon the *Current Value* of Coin, e plenty and ſcarcity thereof, the Riſing and Fall- g, Inhancement and Debaſing of the ſame, it muſt ceſſarily follow, that the Value of Coin is ſubject to Change. An Example whereof you have in *ance*, where their Coin has been Changed, In- nced and Lowered for ſeveral Times in a few ars; and in the Year 1702. the French Crown ich was 60 Sous or 3 Livres, is now raiſed to Sous, or 3 Livres 15 Sous.

e Denomination in which *England*, and the following Places exchange each with other, are, *viz.*

e *Exchange* of Monies *from London* to *Antwerp*, *Amſterdam*, *Hamburgh*, *Liſle*, *Middleburgh* and other Parts of *Flanders*, and *Holland* is *Valued on the Pound Sterling* of 20 Shillings: That is, to *pay*

after the Rate of ſo many Shillings, and Pe
Flemiſh for every Pound Sterling.

The Exchange from *London* to *Paris*, *Roan*, and m
parts of *France*, is *Valued* on the *French Crown*
54 *d.* that is, to pay ſo many *Pence*, or ſo ma
Shillings and *Pence Sterling*, for the *French Crown*.

The Exchange from *London* to *Venice* is made on t
Ducat at 52 *d. Sterling*, to pay ſo many *Pence* a
parts of a *Penny Sterling* for every *Ducat*.

The Exchange from *London* to *Leghorn*, *Genoa*, *Ca*
Madrid, and other parts of *Spain*, is made on t
Dollar or *Piece of Eight*, at 54 *d Sterling*, that is
pay ſo many *pence* or parts of a *penny Sterling*
every *Dollar*.

The PAR *at Antwerp*, *Amſterſtam*, *Hamburgh*, *Li*
Middleburgh and other parts of *Flanders* with o
Pound Sterling, is *thirty three Shillings four Pe*
Flemiſh, for a *pound Sterling*, which thirty th
Shillings four pence, do make 10 Guilders at t
Shillings Sterling the Guilder, or 10 Livres *To*
nois.

The PAR at *Paris*, *Roan*, and other parts of *Fra*
has been reckoned ſometimes at 71 Sous t
Crown of 3 Livres *Tournois*, generally at 60 So
the Crown of 3 Livres, every Livre valued a
Shilling 6 pence Sterling, the Crown valued
6 *d.* Sterling.

The PAR at *Leghorn*, *Madrid*, *Cales*, *Genoa*, is
54 *pence Sterling* for the *Dollar* or *Piece of Eight*.

The PAR at *Venice* with our *Sterling Money* is at
Livres 4 Sous of *Venice per Ducat*, or 51 pen
Sterling, ſometimes 52 pence.

The Hamburgh PAR is ſometimes reckoned at fo
Rix-Dollars and a half, which makes 32 Shillin
Flemiſh for 20 *Shillings Sterling*.

The PAR at *Lisbon* is at 6 *s.* 8 *d.* ½ Sterling on t
Milrea or 1000 Reas.

The PAR at *Oporto* is the ſame as that at *Lisbon*.

T

Value of the most usual Coins with which England *does chiefly Exchange, are,* viz.

	Sterling Money. s.	d.	
1 Stiver is	0	1	1/5
6 Stivers of 1 Shilling Flemish is	0	7	1/5
20 Stivers is 1 Guilder or	2	0	
6 Guilders a pound Flem. of 20 *s.* is	12	0	
33 Shill. 4 *d.* Flemish is	20	0	
1 *Zeland* common Dollar is	3	0	
1 Ducatoon	6	0	
1 Specie Dollar	5	0	

	s.	d.	
12 Deniers, or 1 Soulz is	0	0	3 1/5
20 Soulz, or 1 Livre is	1	6	
3 Livres, or 1 French Crown	4	6	

	Sterling Money. s.	d.	q.
A Mervid is about ⅛ and ¼ of ⅛ *d.*	0	8	5/37
34 Mervides is a Rial, or about	0	4	3/4
11 Rials Plate is 1 Ducat, or	4	4	3/4
10 Rials Plate 1 peice of Eight, or	4	0	
1 Rial *Copper* (is called) *Vellon* or	0	3	[illegible]
15 Rials *Copper* 1 pc. of Eight is about	4	0	

Note, *The* Rial *was formerly valued at* 6 *Pence Sterling, or very near it, and then* 8 *Rials was Piece of* ⅛, *but the Money is of late Years altered.*

	Sterling Money. s.	d.
12 ½ Reas of *Portugal*	0	1
1 Mil Rea, or 1000 Reas	6	8
1 Festoon is	1	3

		Sterling Money s.	d.
Italy.	1 Livre at *Leghorn* is	0	9
	1 Crown Current at *Florence* is	5	3
	1 *Ducat du Banco* at *Venice*	4	4
	1 St. *Mark*	2	10
	1 *Palermo* Florin is	2	6
Germany.	1 Rix-Dollar of the Empire	4	5
	4 ½ Rix-Dollars make 32 Flem. at *Hamburg*, &c.	20	0
	1 Guilder of *Noremburg* is	7	1

A Merchant in London *remits to* Rotterdam 375 10 *s. Sterling, at* 34 *s.* 8 *d. Flemiſh for* 20 *Shilling Sterling, How many Guilders Flemiſh muſt be paid* Rotterdam, *and what is gained per Exchange ?*

s.		*s.*	*d.*		*l.*	*s.*	*d.*
20	—	34	8	*Flem.* what	375	10	0
		12			20		
		416			7510		

```
 7510
  416
-----
45060
 7510
30040
-----------
2 0) 3124160
-----------
2) 156208
-----------
2,0) 7810'4
-----------
 3905
```

Guilders : *Stivers*
facit 3905 : 4

To find the *Gain* or *Loſs* in one Pound, ſubtract *s.* 4 *d.* out of 34 *s.* 8 *d.* the Courſe of Exchange, e Difference is 1 *s.* 4 *d.* *Flemiſh per* Pound, and ſo uch Gain is the Courſe of Exchange in our Favour.

If the Courſe of the Exchange be under Par, it uſt by parity of Reaſon become a *Loſs* to us, and en the Courſe of Exchange is to our Prejudice.

The like is to be obſerved for the Coins Exchand in all other Countries.

I will give but one Example of *Loſs* by Exchange, which, with the foregoing Example of *Gain*, the genious may with Eaſe, travel through the general ourſe of Exchange with all Countries.

A Merchant in *London* remits a Bill of Exchange *Amſterdam* for 297 *l.* 15 *s.* Sterling, at 31 *s.* 3 *d.* *miſh* for 20 *s.* Sterling, I demand how much *Flemiſh* oney was paid for the ſaid Biil in *Amſterdam*, and at is loſt *per* Pound by the Exchange?

s.		*d.*		*l.*		*s.*	
31	:	3	*Flem.*	297	:	13	*Sterling.*

	Guild.		*Shill.*	
Anſwer	2791	:	8	paid, and

2 *s.* 1 *d.* *Flem.* *per* Pound loſt by the Exchange.

PRACTICAL TABLE.

s.	d.	q.	d.	q.	℔.	C.wt.
10	0	$\frac{1}{2}$	6	$\frac{1}{2}$	56	$\frac{1}{2}$
6	8	$\frac{1}{3}$	4	$\frac{1}{3}$	8	$\frac{3}{4}$
5	0	$\frac{1}{4}$	3	$\frac{1}{4}$	28	$\frac{1}{4}$
4	0	$\frac{1}{5}$	$1\frac{1}{2}$	$\frac{1}{8}$	14	$\frac{1}{8}$
3	4	$\frac{1}{6}$	1	$\frac{1}{12}$	16	$\frac{1}{7}$
2	6	$\frac{1}{8}$			8	$\frac{1}{14}$
2	0	$\frac{1}{10}$			7	$\frac{1}{16}$
1	8	$\frac{1}{12}$				

I. *When the given Price is Pence, take your Parts i Shillings*, the Product divided by 20, gives the Anſwer in Pounds.

Or, You may bring it into Pounds, at once, b cutting off the laſt Figure, and by conſidering tha 240 Pence is one Pound, whereof 8 *d.* is $\frac{1}{30}$ 6 *d.* i $\frac{1}{40}$ 4 *d.* is $\frac{1}{60}$ 3 *d.* is $\frac{1}{80}$ 2 *d.* is $\frac{1}{120}$.

Example.

254 ℔ of Tobacco at 1 *d.*

1 | $\frac{1}{12}$ | 2|1 : *d.*

l. 1 : 1 : 2 *facit.*

254 ℔ at 2 *d.*

d.

2 | 42 : 4

l. 2 : 2 : 4 *facit.*

d. $3\frac{1}{80}$

d. $4\frac{1}{60}$

d. $6\frac{1}{40}$

716 Ells at 3 *d.*

s. *d.*

l. 8 : 19 : 0 *facit.*

215 ℔. at 4 *d.*

s. *d.*

l. 3 : 11 : 8 *facit.*

643 Gal. at 6 *d.*

l. 16 : 1 : 6 *facit.*

The Three laſt Examples are brought into Pounds t one Operation, after which manner any Sum in raćtice may be readily caſt up.

Here you may ſee that 254 ℔ of Tobacco at 1 *d.* a ound, divided by the $\frac{1}{12}$, gives 21 *s.* 2 *d.* and that ivided by 20 (by cutting off the laſt Figures, and aking $\frac{1}{2}$ of it) gives 1 *l.* 1 *s.* 2 *d.* the Price of 254 ℔ of Tobacco; and for 2 *d.* a ℔. take the $\frac{1}{6}$; be- auſe 2 *d.* is the $\frac{1}{6}$ part of a Shilling, and for 3 *d.* a ℔ take $\frac{1}{4}$; and ſo for the others at 4 *d.* and 6 *d.*

II. *When the given Price are ſuch pence as are no ven part of a Shilling*, take firſt the greateſt even part f a Shilling, and then part of that part; add them ogether, and divide the Product by 20, or cut off he laſt Figure, and take $\frac{1}{2}$.

d | | 2121 Ells at 5 *d.*

| $\frac{1}{3}$ | 707

| $\frac{1}{4}$ | 176 : 9 *d.*

5 | | 86|3 : 9

44 : 3 : 9 *facit.*

| | 748 ℔ at 7 *d.*

6 | | 392

1 | $\frac{1}{2}$ | 65 : 4 *d.*

| $\frac{1}{6}$ |

1 | | 457 : 4 *d.*

22 : 17 : 4 *facit.*

254 ℔. of Tobacco at 9 *d.* and 10 $\frac{3}{4}$ a ℔.

d.		
6	$\frac{1}{2}$	127
3	$\frac{1}{2}$	63 : 6

9	$\frac{1}{4}$	19|0 : 6
		9 : 10 : 6 *fa.*

d.	254 at 10 *d.* $\frac{3}{4}$
6 $\frac{1}{2}$	127 ſhill. in 254 ſixpences.
4 $\frac{1}{3}$	84--8 in 254 groats.
$\frac{1}{2}$ $\frac{1}{8}$	10--7 in 254 half-pence.
$\frac{1}{4}$ $\frac{1}{2}$	5-- 3 $\frac{1}{2}$ in 254 farthings.
	22|7 : 6 $\frac{1}{2}$
	11|7 : 6 $\frac{1}{2}$ *facit.*

Demonſtration. In 254 ℔. of Tobacco at 10 *d.* $\frac{3}{4}$ a ℔, there muſt be 254 Sixpences, which is 127 Shillings, and 254 Groats, which is 84 *s.* 8 *d.* and 254 Half-pence, which is 10 *s.* 7 *d.* and 254 Farthings, which is 5 *s.* 3 *d.* $\frac{1}{2}$; all theſe added together, make 227 *s.* 6 *d.* $\frac{1}{2}$, which divided by 20, gives the *facit* 11 *l.* 7 *s.* 6 *d.* $\frac{1}{2}$.

		614 ℔. at 11 *d.*
6	$\frac{1}{2}$	307
4	$\frac{1}{3}$	204 : 8 *d.*
1	$\frac{1}{4}$	51 : 2
—		
11		56|2 : 10
		28|12 : 10 *facit.*

		563 ℔ at 12 *d.* $\frac{1}{2}$.
6	$\frac{1}{2}$	281 : 6 *d.*
4	$\frac{1}{3}$	187 : 8
1 $\frac{1}{2}$	$\frac{1}{4}$	70 : 4 $\frac{1}{2}$
		53|9 : 6 $\frac{1}{2}$
		26 : 19 : 6 $\frac{1}{2}$ *facit.*

III. *If the given Price be any Number of Pence above* 1 s. *and leſs than* 2 *s.* take the Aliquot parts in pence, (as in the laſt Precedent) to which add the given Quantity for the 1 s. and proceed as before.

Example

Example.

d. $\frac{1}{4}$
154 ℔. at 15 *d.*
65 : 6
31|7 : 6
15 : 15 : 6 *facit.*

$\frac{1}{3}$ $\frac{1}{4}$
254 at 17 *d.*
84 : 8
21 : 2
35)9 : 10
17 : 19 : 10 *facit.*

$\frac{1}{2}$
264 *yds.* at 18 *d.*
32
39|3
19 : 16 : 0 *facit.*

$\frac{1}{2}$ $\frac{1}{8}$
295 *gall.* at 9 *d.*
27 : 6
24 : 7
46|7 : 1
23 : 7 : 1 *facit.*

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{8}$
672 ℔ at 22 *d.* $\frac{3}{4}$
336
224
42
1174
63 : 14 : 0 *facit.*

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{4}$
456 *Ells* at 23 *d.* $\frac{3}{4}$
228
152
38
9 : 6
88|3
4|3 : 3 : 6 *facit.*

In 672 ℔. at 22 *d.* $\frac{3}{5}$ a ℔. I take $\frac{1}{2}$ for 6 *d.* the $\frac{1}{3}$ for 4 *d.* and the $\frac{1}{8}$ for the $\frac{3}{4}$, becauſe $\frac{3}{4}$ is the $\frac{1}{2}$ of 6 *d.* by which you will find that in 672 Sixpences there is 336 Shillings, and in 672 Groats there is 224 Shillings, and in 672 Three Farthings there is 42 Shillings.

IV. *If the given Price be ſuch Shillings as are an even part of a Pound* Sterling, take ſuch a part of the given Quantity, and the Quotient is Pounds.

	Ells.	*s.*	*d.*	
	433 at 1	:	8	
$\frac{1}{12}$	36	: 4	: 4	*facit.*
	674 at 2 *s.* 6 *d.*			
$\frac{1}{8}$	84	: 5	: 0	*facit.*

	Yrds.			
	271 at 2 *s.*			
$\frac{1}{10}$	27	: 2	: 0	*facit.*
	495 at 3 *s.* 4 *d.*			
$\frac{1}{6}$	82	: 10	: 0	*facit.*

	Crowns.			
	457 at 5 *s.*			
$\frac{1}{4}$	114	: 5	: 0	*facit.*
	295 at 6 *s.* 8 *d.*			
$\frac{1}{3}$	98	: 6	: 8	*facit.*

	Dollars.			
	612 at 4 *s.*			
$\frac{1}{5}$	122	: 8	: 0	*facit.*
	372 at 10 *s.*			
$\frac{1}{2}$	186	: 0	: 0	*facit.*

In this firſt Example of 434 Ells, at 1 *s.* 8 *d.* I take the $\frac{1}{12}$, becauſe 1 *s.* 8 *d.* is the $\frac{1}{12}$ of a *l.* and ſay, 12 in 43 is 3 times, reſt 7. which makes the 4 to be 74; then 12 in 74, is 6 times, reſt 2, which is 2 *l.* that I turn into Shillings, and ſay, 12 in 40 *s.* is 3 times, and there reſts 4 *s.* which I turn into Pence, and it makes 48 Pence; then 12 in 48 is 4 times, and the *Facit* is 36 *l.* 3 *s.* 4 *d.*

V. *If the given Price be ſuch Shillings and Pence as are no even Parts of a Pound,* multiply the given Quantity by the Number of Shillings, and take the Aliquot parts of Pence, and proceed according to the Second Rule of this Chapter.

Ells.
375 at 8 *s.* 6 *d.*
8
3000
½ 187 : 6
318.7 : 7
159 : 7 : 6 *facit.*

Ells.
493 at 15 *s.* 10 *d.*
15
2465
493
½ 246 : 0 *d.*
⅓ 164 : 4 *d.*
780|5 : 10
390 : 5 : 10 *facit.*

C. *s.* *d.*
295 at 12—9
12
½ 3540
174 : 6
73 : 9
376|1 : 3
188 : 1 : 3 *facit.*

C. *s.* *d.*
214 at 7—11
7
1498
½ 107
½ 53 : 6
⅓ 35 : 8
169|4 : 2
84 : 14 : 2 *facit.*

VI. *If your given Price be any Number of Pounds, Shillings and Pence*; reduce firſt your Pounds and Shillings into Shillings, and proceed according to the laſt Rule.

```
       Pieces    l.   s.   d.        Tun     l.   s.   d.
        754 at 4—03—7                176 at 3—7—10
         83     20                    67  20
       ————————                    ————————————
       2262    83                   1232  67
       6032                         1056
 ½      377                        ——————————
 ⅙       62 : 10              ½     11792
       ——————                 ⅓        88
       6302|1 : 10                     58 : 8
       ——————                       ——————
       3151 : 1 : 10 : facit.       1193 8 : 8
                                    ——————
                                     596 : 18 : 8 facit.
```

VII. *If your given Price be any Number of Pounds, and exceeding Five Pounds*, then multiply your given Quantity by the Number of the Pounds, and take your Aliquot part in Shillings and Pence, *viz.*

```
          C.     l.   s.   d.        hheads.   l.   s.   d.
          74 at 11—12—6               394 at 16—16—3.
          11                           16
         ————————                    ————
 s.       814                        2364
 10  ½    37        d.               394
 2½  ¼     9 : 5 : 0            ½     194
         ——————                 ¼      98 : 10
     l.  860 : 5 : 0 facit.     ⅓      24 : 12 : 6
                                        8 :  4 : 2
                                     ——————————
                                     6632 : 6 : 8
```

VIII. *If the given Quantity be any Number of* C. qrs. *or* ℔. *or* Tun. C. qrs. *and* ℔. *&c.* work as before where no part is, and take your Aliquot Parts in Quarters and Pounds, or in C. qrs and ℔. and add them to your firſt Work. An Example or two will make this plain.

```
      C.          s.   d.
      75 ½ at  22 : 6
      22       ——————
    ————         11 : 3
     150
     150
½     37 : 6
      11 : 3
    ——————————
    169|8 : 9
     84 : 18 9 facit.
    ——————————
```

```
     C.          s.   d.
     63 ¾ at 12 : 10
     12       ——————
   ————         6 : 5
    756         3 : 2 ½
½    31 : 6    ——————
⅓    21 : 0    9   7 ½
      9 : 7 ½
   ——————————
   81|8 : 1 ½ facit.
   ——————————
   40:18: 1 ½ facit.
```

In the Example of 63 C. ¾ at 12 *s.* 10 *d.* the C. *weight*, I multiply the C. by 12 *s.* and take the parts in Pence for the odd Pence; then for the ¾ of a C. I firſt take the ½ of the Price of a C. and that makes 6 *s.* 5 *d.* the Price of ½ a C. and then I take the ½ of that, which gives 3 *s.* 2 *d.* ½, the Price of a *qr.* of a C. Add them together, it gives the Price of ¾ of a C. which is 9 *s.* 7 *d.* ½. and muſt be added to your firſt Work. Two or Three Examples more will make it familiar and eaſie to any Capacity.

84 C. 3 *qrs.* 11 ℔. at —— 21 *s.* 10 *d.*

21

84

168

$\frac{1}{2}$ 42

$\frac{1}{3}$ 28

18 : 6

185 2 : 6

92 : 12 : *facit.*

$\frac{1}{2}$ 10 : 11

℔ $\frac{1}{2}$ 5 : 5 $\frac{1}{2}$

7$\frac{1}{4}$ 1 : 4 $\frac{1}{4}$

4$\frac{1}{7}$ 0 : 9 $\frac{1}{4}$

18 : 6

The Price of 3 *qrs.* 11 ℔.

Tun. C. *qr.* ℔. *l* *s.* *d.*

12 : 14 : 3 : 14 at 15 : 17 : 06 a *Tun.*

12

190 : 10 : 00

$\frac{1}{2}$ 7 : 18 : 9

$\frac{1}{5}$ 3 : 3 : 6

$\frac{1}{8}$ 0 : 7 : 11$\frac{1}{4}$

$\frac{1}{2}$ 0 : 3 : 11$\frac{1}{2}$

$\frac{1}{2}$ 0 : 1 : 11$\frac{3}{4}$

Facit 202 : 06 : 1$\frac{1}{2}$

CHAP.

CHAP. XIII.

The Order of Deducting T A R E *and* T R E T.

GROSS is the Weight of a Commodity, with the *Hogſheads*, *Cheſts*, *Box*, or whatever elſe contains it.

TARE is the Allowance given for the Weight of the Cask, Hogſhead, *&c.*

TRET is an Allowance of 4 ℔. in 104 ℔. for Waſte and Duſt on ſome ſort of Goods.

C. qr. ℔. ℔. ℔.
Exam. 11 *hhds.* qr. 45—3—15 *Groſs, Tare* 14 *per* 112
14 • $\frac{1}{8}$ *how many* ℔. *Neat?*
5—2—26 *Tare.*

Facit 40—0—17

I. Here 14 ℔. *Tare* being $\frac{1}{8}$ of 112 ℔. take $\frac{1}{8}$ of the *Groſs*, the Quotient gives the whole *Tare*, which ſubtract from the *Groſs*, gives the *Neat* weight.

The Operation is performed thus: Divide the *Groſs* by 8, ſay, 4 in 45, 5 times, and 5 C. remains, which is 20 *qrs.* and 3 is 23; then 8 in 23, 2 times 7 *qrs.* remains, which turned into Pounds by 28, and added to the 15 ℔. makes 211 ℔. then 8 in 211 is 26 times. So the *Tare* is 5 C. 2 *qr.* 26 ℔.

```
            C.   qr.  ℔.                      s.   d.
Example.   40 : 0 : 17        Neat at   22 : 6
           22                 ℔.        ------
           --                 14 1/8    2 : 9 : 3/4
           80                  2 1/7    0 : 4 : 3/4
           80                  1 1/2    0 : 2 : 1/4
           20                           -----------
               3 : 4 3/4      facit 3 : 2 : 3/4
              -----------     Price of 17 ℔
           90| 3 : 4 3/4
              ------ ----
           45 : 4 : 4 3/4
```

If the *Tare* be 16 ℔. in 112 ℔. take 1/7 of the *Groſs*, and work as before.

If 18 ℔. *per* 112 ℔. for *Tare*, take the Aliquot parts, *viz.*

For 6 ℔. take the 1/7 } Add the *Tare* of 16, and
For 2 take the 1/8 } the *Tare* of 2 together, the
—— Total ſubtract from the *Groſs*, and work as before.

℔. ℔. ℔.
If 20 in 112 for *Tare* { for 16 take 1/7 ℔.
{ for 4 take 1/4 of 16

II. When an Allowance is made for *Tret*, then (after the *Tare* is ſubtracted from the *Groſs*) the Remainder is called *ſubtle*, which divide by 26 becauſe 4 ℔ is the 26th part of 104 (the Allowance always given for *Tret*) the Quotient gives the *Tret*, which ſubtracted from the *ſubtle*, gives the *Neat*-Weight.

Example

C. *qr.* ℔. ℔. ℔. ℔. ℔.

Ex. 45 : 3—15 Gr. *Tare* 16 *in* 112 *Tret* 4 *in* 104

$16\frac{1}{7}$ 6 : 2 : 6 *Tare.*

39 : 1 : 9 *Subtle,* 4) 104 (26

4

157

28

1265

314

4405 *pounds Subtle.* 26) 4405 (169

169 *Tret.* 180

4236 *Neat pound at* 6 d. 245

$6\frac{1}{2}$ 211 8 *d.* 11

105 : 18..0 *facit.*

III. If the Allowance for *Tare* be 8 ℔. 10 ℔. 12 ℔. in 112, or any other leſſer Number, whether an Aliquot part of 112 or not, in ſuch Caſes, divide the *Groſs* into two parts by 2, which will make it half Hundreds, then ſay, 8 is $\frac{1}{7}$ of $\frac{1}{2}$ C. or if 12 ℔ in 112 ℔.

$8\frac{1}{7}$ } When you have found your *Tare,* ſubtract it

$4\frac{1}{2}$ } always out of the whole *Groſs.*

I might enumerate Examples, but theſe being ſufficient to inſtruct any ordinary Capacity in *Tare* and *Tret,*

I ſhall proceed to ſhew ſome other abbreviated ways of caſting up Goods and Merchandize.

CHAP. XIV.

For Retailers *of ſmall* Parcels, *as Mercers, Linnen and Woollen Drapers, Haberdaſhers of Hats*, &c.

THE moſt abbreviated and ready Way, is to multiply the Price by the Quantity.

s. *d.*
Example. Sold 7 Yards of Cloth, at 14 : 6 a yard.
7
Facit l. 5 : 1 : 6

Say 7 times 6 is 42, which is 3 *s.* 6 *d.* ſet down 6 *d.* and carry 3 *s.* to the place of Shillings, and ſay, 7 times 4 is 28, and 3 I carry is 31, ſet down 1 *s.* and carry 3 Angels to the place of Tens of Shillings, and ſay, 7 times 1 is 7, and 3 I carry is 10 Angels, which 5 *l.* ſet a (0) in the place of Shillings, and fix the 5 *l.* in the place of Pounds: So the price of 7 Yards is 5 *l.* 1 *s.* 6 *d.*

s. *d.*
Example 2. Sold 11 Yards and ½ at 13 : 3
11
7 05 : 09
the ½ Yard 6 : 07 ½
Facit l. 7 : 12 : 04 ½

For half a Yard, take half of 13 *s.* 3 *d.* and add to the Product of 11 Yards.

Example

		l.	*s.*	*d.*
Example 3. Sold 14 Yards and ⅛ at		1	07	10
				7
		9	14	10
				2
		19	09	08
4/8 --- ½		00	13	11
⅞ ·· ¼		00	03	05 ¾
Facit l.		20	07	00 ¾

Find the first Price of 7 Yards, *fac* 9 *l.* 14 *s.* 14 *d.* which multipiled by 2, gives 19 *l.* 9 *s.* 8 *d.* the price of 14 Yards; then take the Aliquot parts of ⅛ for the price of one Yard, as you ſee in the Operation: The *facit* is 20 *l.* 7 *s.* 0 *d.* ¾.

	l.	*s.*	*d.*
Example 4. Sold 7 C. ½ of Currans at	2	13	6
			7
	18	14	6
	1	06	9
Facit	20	01	3

Object. There are many Numbers under 100 that are not included in the Multiplication Table, or being multiplied together, will not produce the given Quantity; and ſo conſequently cannot be done by this new Way of Practice.

Anſwer,

Anſw. It's very true, there are ſeveral Numbers under 100 that no two Numbers multiplied together can produce them, ſuch as 13, 17, 19, 26, 29, 31, 34, 37, and many more.

Rule. In ſuch Caſes multiply by two ſuch Numbers, as being multiplied together, will come neareſt to ſuch odd Numbers; then multiply the Price by that part which wants to make up the given Quantity. An Example of which follows.

```
                          s.   d.
5 Exam. 29 Ells, at       7  : 9
                               7
               ------------------
                 2 — 14  : 3
                               4
               ------------------
                 10 : 17 : 0
                       7 : 9
               ------------------
          facit  11 : 04 : 9
```

Here I multiply by 7 and 4, becauſe 7 times 4 is 28, and for the odd Ell to make it 29, I add the Price of the Ell to the Product.

Facit 11 *l.* 4 *s.* 9 *d.*

Example 6. If 34 Ells at the ſame Price multiplied by 8 and 4, make 32, and multiply the Price of one Ell by 2, and add that to the Product, makes 34.

Example

C. qr. ℔. l. s. d.
7 *Example.* 15 : 3 : 7 at 4 : 16 : 06
5

23 : 17 , 06
: 3
71 : 12 : 06
2 : 07 : 09
1 . 03 : 10 ½
5 : 11 ½

l. 75 : 10 : 11 *facit.*

Goods ſold by 112 ℔ *the C. weight.*

1. Account 2 *s.* 4 *d.* for every Farthing in the place of 1 Pound weight.

Example 1. At 3 ½ the Pound, what 112
14 32 : 8 *d.*

2. Or multiply the Pence that 1 Pound weight coſt by 7, and divide by 15, the Quotient is the Price in Pounds of a Hundred weight.

Example, At 7 *d.* the Pound, what coſt 112?
7
15) 35
facit l. 2--6--8

Say, 15 in 32, 2 times, reſt 5, which is 100 Shillings, then 15 in 100, 6 times, reſt 10, it makes 120 *d.* then 15 in 180 is 8 times; *facit* 2 *l.* 6 *s.* 8 *d.*

3. Multiply the Pounds in Money that 112 coſt by 15, and divide the Product by 7, the Quotient gives the Price 1 Pound coſt.

l. *s.* *d.*
If 122 coſt 2 : 06 : 8 What coſt——— 1
5
11 : 13 : 4
3
7) 35 : 00 : 0 *Facit* 5 pence.

Goods ſold by 100.

4, Multiply the Pence that 1 ℔. by 5, and divide by 12, the Product is the Price in Pounds.

At 15 *d.* the Ounce, What coſt 100 Ounces ?
5
12) 75
facit 6 *l.* : 5 *s.*

5. Multiply the Pounds in Money 100 ℔ weight coſt by 12, and divide by 5, the Quotient gives in Pence the price of 1 Pound.

If 100 coſt 6——— 5 What 1 ?
12
5) 75 : 00 *d.*
15 : *facit* 15

Things ſold by 120, *ſuch as Deals*, &c.

6. Multiply the Pence that 1 coſt by 2, and divide by 4, the Quotient is the Price of 120.

What coſt 120 Deals at 13 *d.* the Deal-board?

2—*s.*

4) 26

---

facit 6

7. Or divide the Pence that one is worth by 2, e Quotient will be Pounds.

What coſt 120 Yards of Ribbon at 5 *d.*?

facit 2 *l.* 10 *s.*

8. For Things ſold by 200, annex only a Cypher the Sum of the given Price.

What coſt a Bale of Paper, Quantity 200 Reams, 6 *s.* a Ream? *Facit* 60 *l.*

Wine or Oil ſold by the Tun of 252 *Gallons.*

9. So many Pounds the Tun coſt, abate ſo many illings, and the Gallon will be worth ſo many nce.

Exa. If 252 Gallons coſt 25 *l.* What coſt 1 Gallon?

1 : 5

s. *d.*

23 : 15 *facit.* 1. 11 $\frac{3}{4}$

Here 20 *s.* is valued at 1 penny, ſo that 23 *l.* 15 *s.* but 1 *s.* 11 *d.* $\frac{3}{4}$, the price of 1 Gallon of Oil.

10. For Things ſold by 300, annex a Cypher to e price of one, take half and add them together.

What coſt 300 Chaldron of Coals at 25 *s.*

250
125

375

11. For Things ſold by 500, put a Cypher to the ice, then double it, take half and add the two laſt gether.

What coſt 500 Quarters of Corn, at 31 *s.* a Qu ter ?

310 *s.*

2

620

155

facit 175 Pound

12. For Things ſold by 900, put a Cypher a treble it.

What coſt 600 Hats at 9 *s.*

90

3

facit 270 Pound.

13. For Things ſold by 600, put a Cypher, treb it, take half, and add the two laſt together.

What coſt 700 Gallons at 11 *s.*

110

3

330

55

facit 385 Pounds.

There are abundance of other ſhort ways, whi cannot well be compriſed in this little Tract : Th already given are ſufficient for any ingenious inve tive Head to lay a good Foundation, from whe he may raiſe what Structure he pleaſes.

CHA

CHAP. XV.

INTEREST is either *Simple* or *Compound*.

Simple Intereſt is that which ariſeth, or is computed from the Principal only. And here all Queſtions are done by the Double Rule of Three (called the Compound Rule of Five Numbers) or Practice.

Example. What will the Intereſt of 275 *l.* 11 *s.* 3 *d* come to for a Year, at 6 *per Cent?*

State your Queſtion by the Rule of Three, and ſay,

l. *l.* *s.* *d.*
If 100 gain 6, What will 275 : 11 : 3
6

l. 16|53 : 07 : 6
s. 10|67 : 20
12
l. *s.* *d.*
facit 16 : 10 : 8 : $\frac{10}{100}$ *d.* 8|10

Here 275 *l.* 11 *s.* 3 *d.* Principal is multiplied by 6 *l.* (the Intereſt) being the middle Number, and divided by 100 the firſt Number, by cutting off Two Figures in the Dividend, reſt 53 *l.* which multiply by 20, gives 1067 Shillings, which divided again by 100 as before, reſt 67 *s.* which multiplied by 12, and divided as before, gives 16 *l.* 10 *s.* 8 *d.* the Intereſt for 1 Year.

l. *s.* *d.*
275 : 11 : 3 for a Year, at 5 *l. per Cent.*
5
13|77 : 16 : 3
20
15|56
12
6|75
facit 13 : 15 : 16 $\frac{75}{100}$.

l. *s.* *d.*
275 : 11 : 3 at 5 $\frac{1}{2}$ *per Cent.*
5
1377 : 16 : 3
$\frac{1}{2}$137 : 15 : 7 $\frac{1}{2}$
15|15 : 11 : 10 $\frac{1}{2}$
20
3|11
12
1|42
4 *l.* *s.* *d.*
1|70 *facit* 15 — 3 — 1 $\frac{1}{4}$ $\frac{70}{100}$.

What comes the Inſurance of 975 *l.* 13 *s.* 4 *d.* to, at 4 Guinea's *per Cent.* each Guinea 1 *s.* 6 *d.*?

l. s. d.
975 : 13 : 4
4 : 6 s.

3902 : 13 : 4
$5\frac{1}{4}$—40 : 15 : 8

$1\frac{2}{3}$—243 : 18 : 4

41|95 : 07 : 4 l. s. d.
20 facit 41 : 19 : 0 $\frac{3}{4}$ $\frac{52}{100}$
19|07
12
00|88
4
3|52

l. s. d.
275 : 11 : 3 at 5 *per Cent.* for 14 Months.

	l.	s.	d.
The Int. of 1 Year is	13	15	06
2 Months $\frac{1}{6}$ ———	2	5	11
facit	16—	01—	05 Int. for 14 Mon.

l. s. d.
275 : 11 : 3 at 5 *per Cent.* for 3 Years, 5 Months, 20 Days.

The Intereſt of a Years is, which multiplied by the 3 Years, and take Aliquot Parts for 5 Months and 20 Days, as you ſee in the Operation.

		l.	s.	d.
		——13—	15—	06
				3
m		41---	6---	6
4	$\frac{1}{3}$	41---	1---	10
1	$\frac{1}{4}$	0---	2---	11 $\frac{1}{2}$
Days 10	$\frac{1}{3}$	0---	7---	7 $\frac{3}{4}$
10		0---	7---	7 $\frac{3}{4}$
facit		47---	16---	07

The way uſed by Bankers for caſting up Intereſt, is generally by Days : thus,

They bring the Principal Money into Pence, and multiply it by the Days it is out at Intereſt, and divide by 6083 for 6 *per Cent*, and 7300 for 5 *per Cent*. (which are the Days of a Year multiplied by 100, and divided by the Rate of Intereſt) An Operation in the Compound Rule of Five Numbers, *viz.*

If 100 *l.* in 365 Days gain 6 *l.* Intereſt, What will 75 *l.* gain in 94 Days?

```
Example.  75 : 11 : 3 at Intereſt 70 Days at
          20                      (6 per Cent.
      ------        12) 761 pence (6) 36500
        5511            ---       ----------
          12           6|3 : 5         6083
     -------        ----------
       66135     facit 3|3 : 5
          70
   ---------
6083) 4629450
-----   37135
 761     6370
   ----------
          287
```

Example. 100 *l.* at Intereſt for 75 Days at 5 *per* C.

```
      20
    ————        facit 20 s. 6 d.
    2000
      12                 365
    ————                 100
   24000            ——————————
      75            5) 36500
  ——————            ——————————
  120000                7300
 168000
 ——————          73|00|18000|00
 18000|00        ————  ————340
 ————————          12)246 480
                 ——————————————
                facit 20 : 6 : 42
```

CHAP. XVI.

ompound Intereſt *is that which ariſeth from the* Principal, *and alſo from the* Intereſt *thereof, and therefore is called* Intereſt *upon* Intereſt.

THIS ſort of Intereſt is counted very unlawful, and is ſeldom or never allowed, but by articular Contracts on Valuation of Money ſome-
imes on Purchaſes.

The beſt Way of working this ſort of Intereſt is
y Decimals.

Example. 275 *l.* 11 *s.* 3 *d.* forborn 5 Years at 6 *per*
er Cent. per Annum, Intereſt upon Intereſt, What
ill the ſame amount to?

Reduce the 11 *s.* 3 *d.* into a Decimal Fraction according to the Third Rule of the Eighteenth Chapter of this Book.

11 *s.* 3 *d.* $\frac{1}{2}\frac{3}{4}\frac{5}{8}$ of a Pound Sterling.

Which brought into a Decimal Fraction, is 5625, the Operation of the Queſtion is, *viz.*

If 100 gain 6, What will 275, 5626——
16, 5337

1 Year——291, 0962——6
17, 5257

2 Year——309, 6219——6
18, 5773

3 Year——328, 1992——6
19, 6919

4 Year——347, 8911——6
20, 8734

5 Year——368, 7645——6

Facit 386 *l.* 15 *s.* 4 *d.*

Here the third Number is multiplied by 6, the ſecond Number, and divided by 100 the firſt Number, which is done by ſetting out the two firſt Figures towards the Right-hand, and caſting them away as you multiply them to abbreviate the Work of Multiplications, which would be very large, were they all ſet down, where 15, or more Years Intereſt is forborn, beſides 4 or 5 places of Decimals will be correct to a Farthing or little more, ſo

that

hat the *facit* is 368 *l.* 15 *s.* 4 *d.* the Decimal Fracti-n being valued according to the Sixth Rule of the ighteenth Chapter of this Book.

CHAP. XVII.

Rebate *or* Diſcount *is when a Sum of Money due at any time to come, is ſatisfied by the Payment of ſo much preſent Money, as being put forth at a certain* Rate of Intereſt *for the Time being, will be equal to the Sum firſt due.*

IN *Rebate*, 12 Months is the *firſt* Number, the Rate of Intereſt the *ſecond*, and the Time propoſed the *hird* Number.

Then ſay, If 100, and that *facit* (added together) bate that *facit*, what ſhall the given Sum Rebate?

The Quotient or Quotients ſhew the Rebate; which ſubtracted out of the given Sum ſhews the Money to be paid preſently.

Example 1. What will the Rebate of 795 *l.* 11 *s.* *d.* come to for 11 Months, at 6 *l. per Cent.*?

If 12 Months give 6 *l.* What will 11 Months? *cit* 5 *l.* 10 *s.* Then.

If 105 l. 10 *s.* Rebate 5 *l.* 10 *s.* What will 95 *l.* 11 *s.* 2 *d.*? *facit* 41 *l.* 9 *s.* 5 *d.*

Example 2. The Rebate of 765 *l.* 11 *s.* 2 *d.* comes o for 17 Month at 6 *per Cent.*

If 12 Months give 6 *l.* What will 17 Months? *cit* 8 *l.* 10 *s.*

If 108 *l.* 10 *s.* Rebate 8 *l.* 10 *s.* What will 795 *l.* 11. 2 *d.*? *facit* 62 *l.* 6 *s.* 5 *d.*

Example 3. Sold Goods for 795 *l.* 11 *s.* 2 *d.* to be paid at two, 3 Months, *that is, half at* 3 *Months, and the other half at* 3 *Months after that)* If all the *Money* be paid preſently, what muſt be diſcounted?

Firſt, Divide the given Sum into Two Parts, according to the Time of Payment, as you ſee here; then ſay,

l. *s.* *d.*
795 : 11 : 2
397 : 15 : 7

If 12 Months give 6 *l.* what will 3 Months? *facit* 1 *l.* 10 *s.* 2*d.*

If 101 *l.* 10 *s.* abate 1 *l.* 10 *s.* what will 397 *l.* 15 *s.* 7 *d.* *facit* 5 *l.* 17 *s.* 6 *d.*

If 12 Months give 6 *l.* what will 6 Months give? *facit* 3 *l.*

If 103 *l.* abate 3 *l.* what will 397 *l.* 15 *s.* 7 *d.*? *facit* 11 *l.* 11 *s.* 8 *d.*

Add the Sum of the Rebates together, and ſub-tract it out of the given Sum, gives the *Money* to b paid preſently.

795 : 11 :

l. *s.* *d.*
397 : 15 : 7 for 3 Months ——— 5 : 17 :
397 : 15 : 7 for 6 Months ——— 11 : 11 :

All the Rebate 17 : 09 :

The *Money* to be paid preſently 778 : 02 :

Example 4. Sold Goods for 795 *l.* 11 *s.* 2 *d.* to be paid at 3, 2 Months, if all the *Money* be paid preſently, what muſt be diſcounted ?

Divide the given Sum into Three parts, and work as before; *facit* 15 *l.* 10 *s.* 11 *d.* $\frac{1}{2}$.

Example 5. Sold Goods for 795 *l.* 11 *s.* 2 *d.* to be paid at 4, 1 Month, if all the *Money* be paid down, what muſt be diſcounted ? *facit* 9 *l.* 15 *s.* 9 *d.* $\frac{1}{3}$.

Divide your *Money* into Four Payments, then work as before, *viz.*

12 *mo.* — 6 *l.* —— 1 *mo.* —— *facit* 10 *s.*
100 l. 10 *s.* abate 10 *s.* what will 198 *l.* 17 *s.* 9 *d.*
facit 19 *s.* 9 *d.*

12 *mo.* —— 6 *l.* —— 2 *mo.* —— *facit* 1 *l.*
101 *l.* —— 1 *l.* —— 198 *l.* 17 *s.* 0 *d.* *facit* 1 *l.* 19 *s.* 4 *d.*

12 *mo.* —— 6 *l.* —— 3 *mo.* —— *facit* 1 *l.* 10 *s.*
101 *l.* 10 *s.* abate 1 *l.* 10 *s.* what 198 *l.* 17 *s.* 9 *d.*
facit 2 *l.* 18 *s.* 9 *d.*

12 *mo.* —— 6 *l.* —— —— 4 *mo.* —— *facit* 2 *l.*
102 *l.* abate 2 *l.* what will 198 *l.* 17 *s.* 9 *d.*
facit 3 *l.* 17 *s.* and 11 *d.*

l.	*s.*	*s.*
0	19	9
1	19	4
2	18	9
2	17	11
1	15	9

	l.	*s.*	*d.*
	795	11	2
rebated	9	15	3
Facit	785	15	9

To be paid down.

CHAP.

CHAP. XVIII.

FRACTIONS,

Are of Two Kinds, { *VULGAR* and *DECIMAL.*

A *VULGAR FRACTION* is cauſed by Diviſion of whole Numbers, the Remainder of which being leſs than the Diviſor, called the Numerator, is always the Dividend, and the Denominator is the Diviſor.

3 Numerator.
4 Denominator.

DECIMAL FRACTION is ſuch a *one*, whoſe Denominator is underſtood, and therefore need not be expreſſed: And is an *Unit* with as many Cyphers following it, as there be Figures and Cyphers in the Numerator.

Decimal Fractions, whether they ſtand alone, or be joined with Integers, have always a Comma or Point before them to diſtinguiſh 'em from Integers; at 5 360042.

In *Decimals* the *value* of every Figure or Cypher *decreaſes* by a Tenfold Proportion from the Unit's place towards the Right-hand, as the whole Numbers

bers do increaſe the Value towards the Left-hand, by the like Proportion, as you may ſee in the following Table.

Whole Numbers.	Decimals.
6 C *Thou.*	2 *Tenths.*
5 X *Thou.*	3 *Hund.*
4 *Thou.*	4 *Thou.*
3 C.	5 X *Thou.*
2 X.	6 C *Thou.*
1 *Unit.*	

Cyphers before Integers, and at the End, or Right hand of Decimals are no Value; but after Integers and before Decimals they have their Value; for in Integers they increaſe, and in Decimals they diminiſh the Value of the other Figures joined with them.

In Integers 005 is but 5, and 004 is but 4, and 06 is but 6.

But in Decimals, ,005 is $\frac{5}{1000}$, and ,004 is $\frac{4}{1000}$, and ,06 $\frac{6}{00}$.

And again, in Integers 500 is Five hundred, and 400 is Four hundred.

In Decimals 500 is but 5, and 400 is but 4, *&c.*

Next to Abbreviation and Valuation of *Vulgar Fractions*, there is little required; but to know how to bring a *Fraction* of a *leſſer* Name into a Fraction of a *greater* Name: And to reduce *Fractions* of divers unequal *Denominations* to one Common *Denominator*, which being well underſtood, you may with as much eaſe *Add*, *Subtract*, *Multiply* and *Divide* a *Fraction*, as you can a whole Number.

In *Decimals* a Fraction is ſeldom abbreviated; therefore,

1. *To abbreviate any Vulgar Fractions*, find ſuch a Number for dividing both the Numerator and Denominator thereof, ſo that no Remainder be on either of the Diviſions.

Example. Abbreviate $\frac{96}{120}$ into $\frac{84}{105}$ its loweſt Term.

Say, 12 in 96, 8 times, and 12 in 120, 10, then the Fractions is $\frac{8}{10}$, then ſay, 2 in 8, 4 times, and 2 in 10, 5 times, then the Fraction is $\frac{4}{5}$, ſo that 4 is to 5, as 96 to 120.

2. *To know what part of a Pound Sterling any Number of Shillings and Pence are*, bring the Shillings and Pence into Pence for a Numerator, and place 240 under it (the Pence of one pound) for a Denominator.

Example. What part of a *l.* is 11 *s.* 3 *d?*

$\frac{12}{135}$ *facit* $\frac{135}{240}$.

3. *To reduce Vulgar Fractions into Decimals*, Add Cyphers at pleaſure to the Numerator, and divide by the Denominator. *Example*, viz.

Reduce 11 *s.* 3 *d.* into a Decimal Fraction.

```
  12          24|0)  1350000
 ----        -------  150
 135                   60
 ----    facit 5625   120
 240                 -----
                        0
```

Example. Reduce $\frac{4}{5}$ into a Decimal Fraction.

5) 4000

,800

facit ,800

4. *To value a Vulgar Fraction,* Multiply the Integer into the Numerator, and divide by the Denominator.

What is the $\frac{5}{8}$ of a Pound *Sterling*?

20 *s.*
5
8|100 *d.*
facit 126

s. *d.*
An Ell worth 7 : 9 What is $\frac{2}{5}$ worth?
2
[illegible]) 15 : 6
facit — 3 : 1 $\frac{1}{3}$

5. *To value a mixt Number,* Multiply the mixt Number by the Numerator, and divide by the Denominator. *Example,* viz.

l. *s.* *d.*
A Ship worth 794 : 11 : 9 What is $\frac{5}{8}$ worth?
5
8) 3972 : 18 : 9
facit 496 : 12 : 4 $\frac{1}{5}$

6. *To value a Decimal Fraction, expreſſing Coin*; every *Prime* or *Unit* in the firſt place is 2 *s.* value, every 5 in the ſecond place 1 *s.* and the reſt Farthings; but if they exceed $\frac{25}{48}$, there muſt be one Farthing abated.

Reduce $\frac{7}{9}$ of a Pound into a Decimal Fraction.

$9)\ ,700000$

$,77777$

Here 7 *Primes* is 14 *s.* and 5 taken out of the ſecond place is 1 *s.* which makes 15 *s.* then 2 remains, which is 27, to the thirds, or place of Farthings, out of which abate 1 for $\frac{25}{48}$, it makes 15 *s.* 6 *d.* $\frac{1}{2}$, which is the $\frac{7}{9}$ of a Pound Sterling.

7. *To reduce Vulgar Fractions to a Common Denominator*, Multiply the *Numerator* of each Fraction into every *Denominator*, except its own, which makes that Product of a new *Numerator*; then multiply all the *Denominators* continually together, and that Product is 1 *Common Denominator* to all the *New Numerators*. *Example, viz.*

l. *l.*

Reduce $\frac{2}{3}$ and $\frac{3}{4}$ to a *Common Denominator*.
Facit $\frac{8}{12}$ and $\frac{9}{12}$.

Here 12 is the *Common Denominator* to both the *New Numerators*, *viz.* 8 and 9, and you find that 8 is to 12, as 2 to 3, and 9 is to 12, as 3 to 4.

So that $\frac{8}{12}$ is — to $\frac{2}{3}$, and $\frac{9}{12}$ — to $\frac{3}{4}$.

Reduce $\frac{3}{4}$, and $\frac{5}{6}$, and $\frac{7}{8}$, of a *l.* to a *Com. Denom.*

4			
6	18	40	42
	8	4	4
4			
8	144	160	168
92	192	192	162

To prove your Work, Divide your *New Numerator* by the *Numerator* of that Fraction, and Divide the *Common Denominator* of the Fraction by the *Denominator*, if both Quotients are equal, your Work is true,

Example. $\frac{144}{192}$ $\frac{48}{48}$ here 144 divided by 3, make 48, nd 192 divided by 4, gives 48, which was to be roved. Or, you may prove your Work by *Abbre-iation of Fractions*; but that is attended with much ifficulty, where 4 or more Fractions are reduced to *Common Denominator*.

Now this *Reduction of Fractions* is of little Uſe, therwiſe than to prepare a Fraction to be either *dded*, *Subtracted*, *Multiplied*, or *Divided*.

As if the $\frac{3}{4}$ and $\frac{5}{6}$ and $\frac{7}{8}$ *l.* were to be added toge-er, Reduce them firſt into a *Common Denomina-r*, as in the laſt Rule, it makes $\frac{144}{192}$ and $\frac{160}{192}$ and $\frac{68}{1}$. Add all the *New Numerators* together, make 72, which divided by 192, the *Common Denomina-r*, makes 2 *l.* $\frac{88}{192}$ as in the following Example.

Adi-

$$\text{Addition of Vulgar Fractions}\left\{\begin{array}{r}144\\160\\168\end{array}\right.$$

$$\begin{array}{rr}192) & 472\\ 2) & 88\end{array}$$

$\qquad\qquad$ *l.* $\quad$ *s.* $\quad$ *d*

facit $2\,\frac{88}{192}$, or $9 : 2$

And if the $\frac{3}{4}$ and $\frac{5}{6}$ and $\frac{7}{8}$ *l.* were to be adde together in *Decimals*, reduce them firſt into *Decima* *Fractions*, according to the *Third Rule* of this Chapter and the Operation ſtands, *viz.*

$$\begin{array}{lll} & & 0000\\ \hline \text{Addition of Decimals.} & \frac{3}{4} & ,75\\ & \frac{5}{6} & ,8333\\ & \frac{7}{8} & 85\\ \hline \end{array}$$

Say 4 in 30 is 7 times, an 4 in 20 is 5 times, and f for the reſt.

l. $\quad$ *s.* $\quad$ *d.*

facit 2 ,4583, or, 2 : 9 : 2

By this Addition you ſee how much leſs Work i made by *Decimals* then is in *Vulgar Fractions*, an how eaſie their Value is found out according to th *Sixth Rule* of this Chapter.

8. *To reduce the Compound Fractions, or Fractions of* *leſſer Name into the Fractions of a greater*; Multipl the *Numerators* together for a New *Numerator*, an the *Denominator* multiply together for a New *Denominator*.

Reduce $\frac{3}{4}$ of a Penny into the proper Fraction o a Pound *Sterling*.

Say, $\frac{3}{4}$ of $\frac{1}{12}$ of $\frac{1}{20}$, or $\frac{3}{4}$ of $\frac{1}{240}$, *facit* $\frac{3}{960}$.

9. *To reduce a mixt Number of a leſſer Name into th* *Fractions of a greater*; Reduce the mixt Number into an improper Fraction, and work as before:

Reduce

educe 3 *d.* $\frac{1}{2}$ into the proper Fraction of a Pound (*Sterling.*

$\frac{7}{2}$ of $\frac{1}{12}$ of $\frac{1}{20}$, or $\frac{7}{2}$ of $\frac{1}{240}$, *facit* $\frac{7}{480}$.

y the ſame *Rule* you may Reduce any ſort of ight or Meaſure.

r *Compound Fractions*, their uſe is chiefly to bring ctions of divers Denominations to one and the e Denomination.

s if the $\frac{3}{4}$ of a Penny, $\frac{2}{3}$ of a Shilling, and $\frac{7}{8}$ of ound were added together.

he $\frac{3}{4}$ of a Penny muſt be reduced into the Fra-n of a Pound, and the $\frac{2}{3}$ of a Shilling, muſt be uced into the Fraction of a Pound thus:

f $\frac{1}{240}$ *fac.* $\frac{3}{960}$ } Then the Fractions to be added, are $\frac{3}{960}$, and $\frac{2}{60}$, and $\frac{7}{8}$, which reduce to a Common Denominator, and add them toge-
f $\frac{1}{20}$ *fac.* $\frac{2}{60}$ }

r, either by Decimals or Vulgar Fractions.

C H A P. XIX.

DDITION *of* FRACTIONS.

F *the Fractions to be added have one Common Denominator*, Add all the Numerators together, and ide the Product by the Common Denominator.

Example

$$\textit{Example} \text{ Add } \left\{ \begin{array}{c} \frac{8}{12} \\ \frac{5}{12} \\ \frac{7}{12} \end{array} \right\} \text{ of a Pound together.}$$

$$\begin{array}{r} \hline 12)\ 20 \\ \hline \textit{facit}\ \ 1\,\frac{8}{12} \end{array}$$

2. *If the Fractions to be added be of different Denominators*, Reduce them to a Common Denominator according to the *Seventh Rule* of the laſt Chapter and proceed as before.

Example. Add $\frac{7}{8}$ and $\frac{3}{4}$, and $\frac{2}{3}$ *l.* together.

$$\begin{array}{cccc} 8 & \text{---} & \text{---} & 8 \\ 4 & 28 & 24 & 8 \\ \text{---} & 3 & 3 & \text{---} \\ 32 & \text{---} & \text{---} & 64 \\ 3 & 84 & 72 & \text{---} \\ \text{---} & \text{---} & \text{---} & 96 \\ 96 & 96 & 96 & \end{array}$$

To add $\frac{7}{8}$ and $\frac{3}{4}$, and $\frac{1}{4}$ *of a Pound in Decimals*, Reduce them into Decimal Fractions, according to the *Third Rule* of the laſt Chapter, and add them up as whole Numbers, keeping the Place of Units just under each other.

$$\text{Add} \left\{ \begin{array}{ll} & 0000 \\ \hline \frac{7}{8} & 875 \\ \frac{3}{4} & ,75 \\ \frac{2}{3} & ,6666 \\ \hline \end{array} \right. \qquad \begin{array}{ccccc} & \textit{l.} & \textit{s.} & \textit{d.} \end{array}$$

$$2,2916\ \ \textit{facit}\ \ 2 : 5 : 10$$

CHAP. XX.

Subtraction of Fractions.

TO *Subtract Fractions of different Denominations,* Reduce them to a Common Denominator, ſubtract the leſſer Fraction from the greater.

ample. From $\frac{3}{4}$ *l.* take $\frac{2}{3}$ *l.* from $\frac{9}{12}$

9 8 take $\frac{8}{12}$

facit $\frac{1}{12}$

If you have a mixt Number, (or Integer and Fra-
) and the Fraction to be ſubtracted be greater than
action from which you are to Subtract,
rrow an Integer from the mixt Number, and
s as in the Subtraction of whole Numbers.

mp. From 11 $\frac{2}{3}$ — $\frac{8}{12}$
2 $\frac{3}{4}$ — $\frac{9}{12}$
8 $\frac{11}{12}$

Here I cannot take $\frac{9}{12}$ out of $\frac{8}{12}$, therefore, I borrow an Integer, *viz.* 12, and ſay, 9 out of 12, reſt 3, to which add $\frac{8}{12}$, $\frac{11}{12}$, and carry 1 to 3 in 3 *l.* out of 11 *l.* reſt 8, *facit* is 8 $\frac{1}{12}$.

From 35 $\frac{3}{12}$ from 42
take 19 $\frac{7}{12}$ take 16 $\frac{15}{24}$

facit 15 $\frac{8}{12}$ *facit* 25 $\frac{9}{24}$

traction of Decimals is the ſame as in whole bers, keeping the places of Units juſt under her.

From

l. *l.* *s.*
From $\frac{7}{8}$,875 the $\frac{7}{8}$ is——1
Take $\frac{3}{4}$,75 $\frac{3}{4}$ is——1
s. *d.*
Rest ,125 or 2 : 6 rest
Equal to the Decimal,

CHAP. XXI.

Multiplication of Fractions.

I. TO *Multiply proper Fractions*, Multiply the Numerators together for a New Numer and the Denominators multiply together for a Denominator.

Example. Multiply $\frac{7}{8}$ by $\frac{3}{4}$, *facit* $\frac{21}{32}$.

II. *If a mixt Number and a Fraction are to be multiplied together*, Reduce the mixt Number int improper Fraction, and work as in the last.

Example. Multiply $11\frac{2}{3}$ by $\frac{3}{4}$

$\frac{35}{3}$ by $\frac{3}{4}$ *facit* $\frac{105}{12}$.

l. *l.*
Examp. Multiply $11\frac{2}{3}$ by $2\frac{3}{4}$

l.
$\frac{35}{3}$ by $\frac{11}{4}$, *fac.* $\frac{385}{12}$ or 32 :

III. *To multiply a mixt Number by an Integer*, the Integer an improper Fraction, by placing under it, and reduce your mixt Number into a proper Fraction, and work as in the *First Rule*.

Exa

Example. Multiply $7\frac{5}{8}$ by 4

$\frac{61}{8}$ by $\frac{4}{1}$, *facit* $\frac{244}{8}$.

IV. *Multiplication of Decimals* is the ſame as in whole Numbers, ſaving as many Decimal Parts as re in the Multiplycand and Multiplier, ſo many muſt be cut off from the Product, which if it have not ſo many places, the Defect muſt be ſupply'd with Cyphers towards the Left-hand.

```
Multiply  ,1005            11  ,83
      by  ,031              2  ,87
          ------           ---------
           1005               8281
           3015               9464
                              2366
   -------------           ---------
   facit ,0031155          33  ,9521
```

CHAP. XXII.

DIVISION of FRACTIONS.

TO *Divide Single Fractions*: Reduce them to a Common Denominator, and Divide the New Numerator of the Dividend, by the New Numerator of the Diviſor.

Example. Divide $\frac{7}{8}$ by $\frac{3}{4}$,

28 24

24) 28

facit $1\frac{4}{24}$

If

II. If it happens that the Fractions of the *Diviſ* be greater than the Fraction of the *Dividend*, afte you have reduced them to a Common Denominato the *facit* of ſuch Diviſion is a Fraction.

Example. Divide $\frac{3}{4}$ by $\frac{7}{8}$.

$$\begin{array}{ccl} \overline{} & \overline{} & \\ 24 & 28 & \textit{facit } \frac{14}{17} \end{array}$$

III. *To divide an Integer by a Fraction*, Multipl the Integer into the Denominator, and divide by th Numerator.

Example. Divide 8 by $\frac{5}{6}$.

$$\begin{array}{r} \overline{} \\ 5)\ 48 \\ \hline \textit{facit } 9\frac{3}{5} \end{array}$$

IV. *To Divide a Fraction by an Integer*, The Nume rator is Numerator, and the Integer multiplied b the Denominator is Denominator.

Example. Divide $\frac{3}{4}$ by 3, 4.

$$\begin{array}{r} 3 \\ \hline 12\ \textit{facit } \frac{3}{12}. \end{array}$$

V. *To Divide a mixt Number by an Integer*, Reduc the mixt Number into an improper Fraction, whoſ Denominator multiply by the Integer for you Diviſor.

Divid

Divide $3\frac{3}{8}$ by 2

$\frac{7}{8}$ by $\frac{2}{1}$ $\quad$ 16) 27

1 — $\frac{11}{16}$ *facit* 1 $\frac{11}{16}$.

VI. *To divide a mixt Number by a Fraction.* Reduce e mixt Number into an improper Fraction, and ork as before.

Example. Divide $3\frac{3}{4}$ by $\frac{4}{7}$

$\frac{15}{4}$ by

105 (16) 105

9

facit $6\frac{9}{16}$

VII. *To divide an Integer by a mixt Number*, Reduce e mixt Number and Integer into improper Fracti- s, and proceed as before.

Example. Divide 5 by $\frac{3}{5}$

$\frac{5}{1}$ by $\frac{18}{1}$

18) 25

7.

facit 1 $\frac{7}{18}$

VIII. *To divide a mixt Number by a mixt Number*, duce them into improper Fractions, and divide before.

Example. Divide $3\frac{3}{5}$ by $2\frac{3}{4}$

$\frac{18}{5}$ by $\frac{11}{4}$

55) 72

facit 1 $\frac{17}{55}$ 17

Diviſion of Decimals is the ſame as in whole mbers, 'till the Work be done. And then uſe

the

the Converſe of the Rule for *Multiplication*, vi
many *Decimals* as are in the *Dividend*, ſo m
there muſt be in the in *Diviſor* and *Quotient*:
if there be not ſo many, the *Quotient* muſt be
plied with Cyphers towards the Left-hand.

Example. Divide 33,9521 by 2,87

2,87) 525
2382
facit 11,83 861
00

See the Converſe in Multiplication of Decimal

CHAP. XXIII.

The Rule of Three in Fractions.

RULE: You muſt multiply your Second
Third Numbers together, and divide by y
Firſt.

Obſerving the ſame Method as in whole N
bers, *viz.* That the Firſt and Third Numbers be
one Name or Denomination.

Examp. If $3\frac{2}{3}$ d. buy $\frac{2}{3}$ ℔ of *Tobacco*, What ſhall 9
buy?

$\frac{7}{2}$ of $\frac{1}{240}$

l. ℔. l.
$\frac{7}{480}$ — $\frac{2}{3}$ — $95\frac{3}{4}$
4
383 by $\frac{2}{3}$
$7\frac{6}{1}\frac{6}{2}$ *facit.*

Div

```
Divide 766/12 by 7/480
            7      766
          ----    -----
           84     2880
                 2880
                3360
                -------
   84)          367680
  -----          316
facit 4377 ℔     648
  of Tobacco     600
                 -----
                  12
```

CHAP. XXIV.

Menſuration of Plain Superficies.

The Menſuration of Plain Superficies (or Flat Meaſure) *ſuch as Board, Glaſs, Wainſcot, Painting, and the like.*

Note 1. THAT in *Superficial Meaſure*, 11 times 12 Inches, being 144 Inches, are the Number of Inches contained in a Square Foot of Superficial Meaſure.

2. That to ſquare any Number, is to multiply it in it ſelf, as if you would know how many ſquare Feet is contained in a Yard ſquare, multiply 3, by Feet in one Yard by 3, the Product is 9, and ſo many Feet make a Yard ſquare.

Example. How many ſquare Inches are there in Yard ſquare?

1 Yard is 3 Feet.
12
——
36 Inches.
36
——
136
216
——
facit 1926 Inches.

General Rule is to multiply the Length by th Breadth, the Product is the Content.

Example 1. A Board 12 Foot long, and 14 Inche broad, How man ſquare feet?

12
——
144
14
——
576
144 Inch. 12 foot.
$2\frac{1}{6}$ ——— 02
144) 0016 Inch. ——
facit 14 feet 576 *facit* 14 ſquare feet.
——
00

But the beſt way is to take Aliquot Parts for 1 Inches, as you ſee wrought in the laſt Exampl And this being the moſt practical and ready way, ſhall purſue it in all the Variety of Superficial Menſuration that followeth.

Exampl

Example. 2. A piece of Wainſcot 24 Foot, 9 Inhes long, and 11 Foot deep, How many ſquare Yards?

Feet Inch
24—9
11 Mult.
9) 273—3
facit 30-0-8

Or thus,
yd. fe. inc.
8...0...6 long.
3...2...0 deep.
24...2...3
1 $\frac{1}{3}$ ...2...2...3
1 $\frac{1}{3}$ ...2...2...2
facit 3●...0...9

Here 24 Foot 9 Inches is multiplied by 11 Foot, he height which makes 272 Feet 3 Inches, that divied by 9, gives 30 Yards, 8 Inches, and ¾.

But the eaſieſt and beſt way is to bring the height nd length into Yards, and then multiply them as ou ſee in the *Example* following.

Example 3. A Painter hath done a Room 90 Foot bout, and 11 ½ Foot high, I demand the ſquare Yards therein?

yd. fe. inc.
32—2—0
2—2—6
98—0—0
$\frac{1}{3}$—10—2—8
$\frac{1}{3}$—10—2—8
$\frac{1}{2}$—5—1—4
Facit 125—0—8

feet
3) 98
32—feet.

yds. feet inch.
Anſ. 125—08

Example. A *Glaſier* hath done a Pane of Glaſs o
5 Foot, 72 high, and 2 Foot, 54 broad, at 6 *d.* th
Foot ſquare.

☞ *Note*, The *Glaſiers* Foot is divided into 10 parts, and every part into 10 parts more

5, 73
5, 54
———
2292
2865
1146
————
14, 5542 Foo

Facit 14 ½ or 14, 5542

A General Rule to Meaſure Round or Square Pillars.

Multiply the Length by the Circumference o *Round Pillars.*

And for *Square Pillars,* add the Four Sides o Breadth together, and multiply the Total by th Length.

Example 5. A Painter hath done a Pillar of 6 Foo 3 Inches Circumference, and 14 Foot 9 Inches long I demand the Square Yards of Painting. ?

yrd. fo. inc.
4—2—9 length
2—0—3 circumf.
———
Inch 9—2—7
36—3 ½ 8—1—1 $\frac{9}{12}$
———
10—1—0 $\frac{9}{12}$

Example 6. A Pillar 6 Yards 2 Foot 9 Inches long, d 2 Foot 1 Inch in breadth each ſide, how many uare Yards ?

yrd. fo. inc.
6——2——5 length.
3——0——0 breadth.
——————.——————

d. fo. inc.
—0——0 broad. *facit* 20——1——3

For *Regular Polygons*, add all the Sides together, d multiply the Total by the Length.

For *Cones*, multiply half the Length by the Cir-umference.

For *Pyramids*, add all the Breadths at the Baſe gether, and multiply half the Length by the Total.

For *Globes*, multiply the Area of the Circle by 4, gives the Content.

CHAP. XXV.

Menſuration of Solids.

olids ; *ſuch as Stone, Timber,* &c. *are Meaſured by the* Cubick *or* Solid *Foot : Now a Cube is a Figure like a Dye of* 6 *equal ſides, and a* Cubick *Foot contains* 12 *Inches Square on every ſide.*

THE *Rule* is, Multiply the length by the breadth, and that Product multiply by the depth, which divide by 1728, the Cubick Inches in a Foot Solid.

Example.

A Piece of Timber 16 Foot long, 14 Inches broad, and 9 Inches deep, How many ſolid Feet doth i contain?

```
         12                 16
         12                 12
       ----               ----
        144                192
         12                 14
       ----               ----
       1728                168
                           192
                          ----
                          6828
                             9
                          ----
           1728) 24192 facit 14 Foot.
           -----  6912
             14   ----
                   000
```

Example.

A Stone 7 Foot 3 Inches long, 4 Foot 5 Inches broad, and 2 Foot 3 Inches deep, How many ſolid Feet?

7—3 4—5 2—3
12 12 12
87 length 53 27
53 breadth
261
435
4611
27 deep
32277
9222
facit 124497 Cubick Inches.

1728) 134497
3537
facit 72
ſolid feet 81

To find how many Inches in length make a Foot of Square Timber, Multiply the Number of Inches ſquare in it ſelf for Diviſor, and make 1728, the Cubical Inch of a Foot, your Dividend.

Example.

A Piece of Timber 18 Inches ſquare, What length will it require to make a Foot Solid?

18

18

144

18

324) 1728

facit 5 Inc. 108

Example.

How many Inches in length will make a Foot at 12 Inches Square?

12

22

144) 1728

288

Facit 12 In—

00

CHAP.

CHAP. XXVI.

Menſuration of Plank.

A TABLE, ſhewing how many Foot of Plank of all Natures make a Load or Tun of Timber.

50 Foot a Load. 40 foot a Tun.

Inch.	Foot.			
4 Plank	150	make a Load.	3	Which divided by, gives the quantity of Feet.
3	200		4	
2½	240		4⅘	
2	300		6	
1½	400		8	
1	600		12	
¾	800		16	

4 Plank	120	make a Tun.	3	Which divided by, gives the quantity of Feet.
3	160		4	
2½	192		4⅘	
2	240		6	
1½	320		8	
1	480		12	
¾	640		16	

Example

Example.

In 7685 Foot of 4 Inch Plank, How many Load and Feet of Timber ?

3) 35

15|0) 768'5 ———

——— 18| 11 $\frac{2}{3}$ Load Feet

51 ——— *facit* 51 11 $\frac{2}{3}$

35|11 $\frac{2}{3}$ Feet.

The Remainder 35, divided by 3, makes Feet 11$\frac{2}{3}$.

Example 2.

In 7685 Feet of 3 Inch Plank, How many Tun and Feet of Timber ?

16'0) 768'5 Tun. Foot.

——— 128 *facit* 48—01 $\frac{1}{4}$

48 ——4) 5

50 ———

1 $\frac{1}{4}$

The Remainder of the Diviſion is divided by the third Column, as in the Example above, the 7685 Feet is divided by 160, the Number of Feet that make a Tun of 3 Inch Plank, and 5 remains, which divided by 4, the Figure even with it gives 1 Foot $\frac{1}{4}$, [illegible] the *Facit* is 48 Tun 1 $\frac{1}{4}$ Foot.

The END.

BRITISH MUSEUM 12FE80

A SHORT and EASY METHOD;

After which

SHOP-KEEPERS

MAY

State, *Poſt*, and *Balance*

THEIR

BOOKS of ACCOMPTS.

By CHARLES SNELL, *Writing-Maſter,*
and Accomptant, in Foſter-Lane,
LONDON.

With whom Young GENTLEMEN
may Board.

BRITISH MUSEUM

A Short and Eaſy METHOD; *after which* SHOP-KEEPERS, *may* State, Poſt, *and* Balance *their* BOOKS *of* ACCOMPTS.

INSTRUCTIONS.

Queſt. WHAT is the firſt Thing I muſt do, who deſign to keep my Books of Accompts after this Method?

Anſw. You muſt make an Inventory; an *Example* of which is at the End of theſe *Inſtructions.*

Q. How muſt I poſt the Firſt Part of this Inventory?

A. You muſt poſt it on your Poſting-Book, *viz.*

Merchandize, to the *Debit* of that Accompt.

Caſh, to the *Debit* of your Caſh-Book.

George Mattock's Debt, to *Debit* of his Accompt.

Germain Bagin's Debt, to his *Debit* alſo.

And for the whole Sum (*viz.* 730 *l.*) you muſt give Counterpart in *Credit* of Stock.

Q. How muſt I poſt the other part of this Inventory?

A. To the *Credit* of *Tho. Roberts*, the Sum you owe him.

To the *Credit* of *John Field*, the Sum you owe him.

And for the whole Sum (*viz.* 110 *l.*) you muſt *debit* Stock. See the ſeveral Accompts, *Fol.* 1, 2.

Q. I ſee by the 1ſt Page of the Day-Book, that it contains Entries of Goods ſold to ſundry Perſons: How muſt theſe be poſted?

A. To *debit* of *Rich. Hunt*, what ſold him.

To *Debit* of *Anthony Cocoart*, the like.

To *Debit* of *J. Graves* and Company, the like.

To *Debit* of *Rich. Hunt*, the like. See their Accompts, *Fol.* 3.

And Counterpart muſt be given for the whole Sum of this Page (*viz.* 16 *l.* 10 *s.* 10 *d.*) on *Credit* of Merchandize in the ſaid Poſting-Book. See Account of Merchant, *Fol.* 1.

And the like muſt be done for the Pages 2, 3, 4, 5 and 6 of the ſaid Day-Book.

Note, That the Ready Money taken for Goods ſold, is poſted each Month to the *Debit* of your Caſh-Book. See the *Caſh-Book*.

Q. How muſt I enter the Monies I receive (of Debtors on my Ledger?)

A. On the *Debit* Side of your Caſh-Book: See that Book.

Q. How muſt I poſt thoſe Sums received, into my Poſting-Book?

A. To the *Credits* of the Perſons, of whom received. See the Accompts of

Richard Hunt,	Fol. 3.
Anthony Coccart,	Fol 3.
John Graves and Company	Fol. 3.
Tho Woodman	Fol. 3.
Henry Taft,	Fol. 4.

Q. How muſt I poſt (into my Poſting-Book) the Total Receipts of the Month of *Auguſt* (*viz.* 57 *l.* 3 *s.* 10 *d.*

A. You muſt poſt that Total, to the *debit* of your Caſh, in your Poſting-Book, writing,

To Sundries. Received per *Caſh-Book.* See the Accompt of Caſh, in the Poſting-Book, *Fol.* 1.

Do the like for *September* and *October*'s Receipts.

Q. How muſt I enter the Moneys I pay to thoſe I owe to, and who have Credit in my Poſting-Book?

A. On the *Credit-ſide* of your Caſh-Book. See the Caſh-Book.

Q. How muſt I poſt thoſe Sums paid?

A. To the *Debits* of the Perſons to whom paid. See the Accompts of *Thomas Roberts*, Fol. 2. and *John Field*, Fol. 2. in your Poſting-Book.

Q. How muſt I poſt (into my Poſting-Book) the Total Payments of the Month of *Auguſt*. (*viz.* 30 *l.*)?

A. You muſt poſt it to the *Credit* of your Caſh, in your Poſting Book, writing.

By Sundries, paid per *Caſh-Book.* See the Account of Caſh in your Poſting-Book, *Fol* 1.

Q. I underſtand by theſe *Directions*, how to *State* and *Poſt* my Books, How muſt I proceed in *Balancing* my Poſting-Book?

A. Value your Merchandize remaining unſold, and Enter the Sum of their Value on *Credit* of the Account of Merchandize, in your Poſting-Book, See the Account of Merchandize, *Fol.* 1.

And give Counterpart in *debit* of the Accompt of Balance in the ſaid Poſting-Book. See the *Debit* of Balance, *Fol.* 4.

Which done, ſubtract the *debit* ſide of ſaid Account of Merchandize from its *Credit*, and place the Remainder (*viz* 97 *l.* 10 *s.*) on the *debit* ſide of it. See the Accompt, *Fol.* 1.

And give Counterpart on *Credit* of *Profit* and *Loſs* in the ſaid Poſting-Book. See Account of *Profit* and *Loſs*, *Fol.* 4.

Then add up Debtor and Creditor of the Account of *Caſh* in the ſaid Poſting-Book, and ſubtract the *Credit* from the *Debit*, and place the *Caſh* remaining (*viz.* 297 *l.* 07 *s.* 01 *d.*) on *Credit* of ſaid Accompt of *Caſh*. See the Accompt, *Fol.* 1. and give Counterpart in *Debit* of the Accompt of Balance See ſaid Accompt of *Balance*, *Fol.* 4.

Q. How muſt I do with the Accompt of *Expences*?

A. Write on its *Credit-ſide* (the 32 *l.*) By *Profit* and *Loſs*, and give Counterpart in *Debits* of the Accompt of *Profit* and *Loſs*. See both the Accompts, *Fol* 2. 4.

Q. How muſt I do with the Accompt of *George Mattock*, who I find (by his Accompt) owes me 10 *l.*

A. You muſt write on *Credit* of his Accompt. By Balance, now owing to me 10 *l.*

And give Counterpart on *Debit* of *Balance*. See both the Accompts, *Fol.* 2. 4.

Do in the ſame manner by the Accompts of

Germain Bagin —— Fol. 2.
Richard Hunt, —— Fol. 3.
John Graves and Company.—— —— Fol. 3.
And *Thomas Woodman*. — Fol. 3.

See their particular Accompts in your Poſting-Book.

Q. How muſt I do with the Accompt of *Thomas Roberts*, to whom I find I owe 20 *l.*?

A. You muſt write on the *Debit* of his Accompt. To Balance, now due to him 20 *l.*

And give Counterpart on *Credit* of *Ballance*. See both the Accompts, *Fol.* 2. 4.

Do the like with the Accompt of *John Field*. See his Accompt, *Fol.* 2.

Q. How muſt I do to Balance, or Cloſe, the Accompts of *Stock*, and *Profit* and *Loſs*?

A. Subtract the *Debit* or *Profit* and *Loſs* from its *Credit*, and ſet the Remainder (*viz.* 65 *l.* 10 *s.* being your clear Gains during the Time of this Trade) on the *Debit* of *Profit* and *Loſs*. See the Accompt *Fol.* 4.

And give Counterpart in *Credit* of *Stock*. See Accompt of *Stock*, *Fol.* 1.

Q. How muſt I do to Balance the Accompt of *Stock*?

A. Subtract its *Debit* from its *Credit*, and ſet the Remainder (*viz.* 685 *l* : 10 *s.* being your preſent *Net-Stock*) on the *Debit* of *Stock*. See the Accompt, *Fol.* 1.

And give Counterpart in *Credit* of Balance. See Accompt of *Balance*, *Fol.* 4.

This done, your Poſting-Book is Balanced, and the Accompt of *Balance* (if you have proceeded right) will be equal on both Sides.

The *INVENTORY.*

London, Auguſt 1, 1723.

I Have in *Merchandize* of ſundry Sorts, to the Value of ——	*l.* 520 : 00 : 00
In Caſh, or ready Money ——	*l.* 180 : 00 : 00

Owing to me, by

Richard Mattock ——	*l.* 20 : 00 : 00
Germain Bagin ——	*l.* 10 : 00 : 00
	l. 730 : 00 : 00

Owing by me, to

Thomas Roberts ...	*l.* 60 : 00 : 00	
John Field ——	*l.* 50 : 00 : 00	
		l. 110 : 00 : 00
	My Net-Stock ...	*l.* 620 : 00 : 00

A BOOK OF RECEIPTS and PAYMENTS,

Otherwiſe called

CASH-BOOK.

		1. Receipts --- Debtor.		*l.*	*s.*	*d.*
		Auguſt, 1723.				
	1	To Stock by Inventory	1	180	---	---
	8	*Richard Hunt*, of him	3	4	---	---
	12	*Anthony Coccart*, ditto	3	3	6	06
	16	*John Graves* and Comp. ditto	3	1	10	06
	20	*Thomas Woodman*, ditto	3	4	13	---
	30	*Henry Taft* ditto	4	0	15	---
pt	31	Merchandize ſince 1ſt *Auguſt*.	---	42	17	10
		l. 57 : 03 : 10 : Received.	---	257	03	10
		September, 1723.				
		Laſt Balance	---	237	03	10
	11	*Richard Hunt*, of him	3	8	15	11
	---	*Anthony Coccart*, ditto	3	3	---	---
	15	*George Mattock*, ditto	2	10	---	---
	20	*Germain Bagin*, ditto	2	5	---	---
	24	*Henry Taft*	4	2	06	---
	30	*John Graves* and Comp. ditto	3	2	---	03
pt.	---	Merchandize ſince 1ſt *Sept.*	---	38	06	06
		l. 69 : 18 : 08 Received.	---	277	02	06

	1. Payments --- Creditor.		*l.*	*s.*	*d.*
	August, 1723.				
23	By *Tho. Roberts*, to him	2	20	—	—
31	*John Field* --- ditto	2	10	—	—
	Paid this Month		30	—	—
	Resting *per* Balance		207	03	10
			237	03	10
	September, 1723.				
22	*John Field* --- to him	2	5	—	—
28	*Thomas Roberts*, ditto	2	10	—	—
	Paid this Month		15	—	—
	Resting *per* Balance		262	02	06
			277	02	06

2.

Receipts - - - Debtor.

				l.	s.	d.
		October, 1723.				
		Laſt Balance	---	262	02	06
	11	To *Anthony Coccart*, of him ——	3	2	---	---
	20	*John Bird* —— ditto ——	4	2	18	---
	31	*John Graves* and Comp. ditto ——	3	5	15	03
pt.	---	Merchandize ſince 1ſt *Octob.* ——	---	86	11	04
		l. 97 : 04 : 07 Received.	---	359	07	10
		November, 1723.				
		Laſt Balance	—	297	07	01

Payments

	2. **Payments - - - Creditor.**		*l.*	*s.*	*d.*
	October, 1723.				
24	By *Tho. Roberts*, to him	2	10	--	--
28	*John Field* - - - ditto	2	20	--	--
31	Expences, *&c.* ſince 1 *Auguſt*	2	32	--	--
	Paid this Month	---	62	--	--
	Reſting *per* Balance	---	297	07	01
		---	359	07	01
	November, 1723.				

A
DAY-BOOK,
Otherwiſe call'd
JOURNAL.

	Day-Book 1.	*l.*	*s.*	*d.*
	Accompts Debtor to Merchandize Sold.			
	Aug. 1. 1723.			
3.	*Richard Hunt*,			
	39 ½ Ells Linen, at *s.* 3 : 2	6	05	01
	ditto			
3.	*Anthony Coccart*,			
	58 ½ Ells of Linen, at *s.* 2 : 4	6	16	06
	ditto 5.			
3.	*John Graves* and Comp.			
	3 doz. Sciſſors, at 4. 0. *l.* 0 : 12 : -			
	3 doz. ditto 3. 9. *l.* 0 : 11 : 3			
	6 doz. round points 3. 9. *l.* 1 : 02 : 6			
	6 doz. middling 2. 8. *l.* 0 : 16 : -			
		3	10	09
	ditto 10.			
	Richard Hunt,			
3.	3 Maſſes of Pearl, at *l.* 0 : 2 : 6	0	07	06
	Merchandize ſold	16	10	10

	Day-Book 2.	*l.*	*s.*	*d.*
	Accompts Debtor to Merchandize.			
	Sold.			
	Auguſt 17, 1723			
4	*Thomas Woodman,*			
	22 doz. Sciſſors — 4. 3. *l.* 4 : 13 : 6			
	6 doz. middling 4. 3. *l.* 1 : 05 : 6			
	9 doz. ditto — 2. 8. *l.* 1 : 04 : 0			
	21 doz. ſmall — 2. 6. *l.* 1 : 10 : -			
		8	13	—
	ditto 20.			
3	*Anthony Coccart,*			
	1 Looking-glaſs — *l.* 0 : 08 : 6			
	1 ditto middling — *l.* 0 : 09 : 6			
	3 Tortoiſe-ſhell Combs *l.* 0 : 06 : 0			
		1	04	—
	ditto 23.			
4	*Henry Taft,*			
	1 doz Sciſſ. with Caſes *l.* 0 : 09 : 6			
	1 doz. without Caſes — *l.* 0 : 05 : 6			
		0	15	—
	Merchandize ſold —	3	12	—

Day-

Day-Book 3.

		l.	*s.*	*d.*
	Accompts Debtor to Merchandize.			
	Sold.			
	Auguſt 27. 1723.			
3.	*Richard Hunt,*			
	3 pair Sciſ. half barb.--*l.* 0 : 06 : .			
	1 doz. ditto, ſmall ſett --*l.* 0 : 05 : .			
	2 Knives at 20 *d.* ——*l.* 0 : 03 : 4			
	1 doz Comb-bruſhes—*l.* 0 : 03 : .			
	6 Pen-knives at 8 *d.*—*l.* 0 : 04 : .			
	12 doz. Claſp-knives --- *l.* 1 : 17 : .			
	24 doz. Kniv. horn Hand. *l.* 3 : — : .			
		5	18	4
	ditto 31.			
1.	Receipts in ready Money for Goods ſince the 1ſt of *Auguſt* ——	42	17	10
	September 3. 1723.			
4.	*Henry Taft,*			
	A parcel of Sciſſors, at ——	0	12	—
	Merchandize ſold—	49	08	2

Day-Book 4.

Accompts Debtor to Merchandize.

Sold.

September 6, 1723.

		l.	s.	d.
3.	*Richard Hunt*, 2 Maſſes Pearl, at ———— s. 2 : 6	0	05	—
	——— ditto 11. ———			
3.	*Richard Hunt*, 13 Ells Cloth, at ———— s. 2 : 6	1	12	06
	——— ditto 15. ———			
3.	*Anthony Coccart*, 4 Maſſes Pearl, — 1. 6. l. 0 : 10 : - 1 ½ doz. Pendants — 4. 0. l. : 06 : -			
	——— dtto 16. ———	0	16	--
4.	*Henry Taft*, 12 doz. Horn-trumpets 2. l. 1 : 04 : - 2 doz. Comb-bruſhes 3. l. 0 : 06 : - 2 doz. ditto ——— 2. l. 0 : 04 : -			
		1	14	—
1.	Merchandize ſold ———	4	07	06

Day-

	Day-Book 5.	l.	s.	d.
	Accompts Debtor to Merchandize.			
	Sold.			
	September 30, 1723.			
4	*John Bird,*			
	3 Maſſ. Ven. Pearl, at *l.* 1 : 00 : -			
	2 doz. Sciſſors, at — *l.* 8 : 09 : -			
	3 doz. fine Combs, at *l.* 1 : 09 : -	2	18	—
	ditto			
3	*John Graves* and Comp.			
	1 piece white Gauſe qt. 24 Ells.			
	1 piece — ditto — 22			
	1 piece — ditto — 20			
	1 piece — ditto — 18			
	1 piece yellow, ditto — 20			
	1 piece black, ditto — 19			
	Ells — 123 at 21 *d.*	0	16	03
	Merchandize ſold —	3	13	03

	Day-Book 6.	l.	s.	d
	Accompts Debtor to Merchandize.			
	Sold.			
	September 30. 1723.			
1.	Receipts in ready Money for Goods ſince the 1ſt of *September*	38	16	06
	October 2, 1723.			
3.	*Thomas Woodman,* 1 doz. Sciſ. Caſes, at - - *l.* 0 : 12 : - 4 Maſs Pearl, at 2 *s.* 0 *d.* *l.* 0 : 08 : - 9 Maſs, ditto, at 2 *s.* 8 *d.* *l.* 3 : 17 : 4	4	17	04
	ditto 29.			
3.	*Thomas Woodman,* 2 pieces Tabby, qt. 61 Ells — 8 *s.* 6 *d.* *l.* 25 : 18 . 6 1 piece, ditto, qt. 28 Ells, — 8 *s.* 6 *d.* *l.* 11 : 18 : 6	37	16	06
	ditto 31.			
2.	Receipts in ready Money for Goods ſince the firſt of *October*	86	11	04
	Merchandize ſold	168	01	08

A POSTING-BOOK,

Otherwiſe called

LEDGER.

ALPHABET.

B.	
Bazin, Germain	2.
Bird, John	4.
Balance	4.
C.	
Coccart, Anthony	3.
Caſh	1.
E.	
Expenc. and Abatem.	2.
F.	
Field, John	2.
G.	
Graves, John & Comp.	3.
H.	
Hunt, Richard	3.
M.	
Merchandize	1.
Mattock, George	2.
P.	
Profit and Loſs	4.
R.	
Receipt and Paym. Caſh	1.
Roberts, Thomas	2.
S.	
Stock	1.
T.	
Taft, Henry	4.
W.	
Woodman, Thomas	3.

Poſting-Book 1.

				l.	*s.*	*d.*
		Stock —— Debtor.				
1723 *Aug.*	2	To ſundry to whom I owe —	—	110	---	—
Oct.	31	To Balance N. Stock.	4	685	10	—
			---	—	---	—
			—	795	10	—

				l.	*s.*	*d.*
		Merchandize, Debtor.				
1723 *Aug.*	1	To Stock, *per* Inventory —	1	520	—	—
Oct.	31	To P. and L. carried thither -	4	97	10	—
			---	617	10	—

				l.	*s.*	*d.*
		Receipts, or *Caſh* Debtor.				
1723 *Aug.*	1	To Stock, Money *per* Inven. -	1	180	---	—
	31	To Sund. *per* Book, page 1 —	---	57	03	10
Sept.	30	To Sundries —— 1 —	---	69	18	08
Oct.	31	To Sundries —— 2 —	—	97	04	07
			---	404	07	01

Poſting-

		Poſting-Book 1.		*l.*	*s.*	*d.*
1723		Stock - - - Creditor.				
Aug.	31	By Sund. *per* Inventory ——	—	730	—	---
Octob		By Pro.& Loſs,gain'd in 3 Mo.	04	65	10	---
			—	795	10	---
1723		Merchandize, Creditor.				
Aug.	10	By Sund. ſold, Day-Book 1 ——	—	16	10	10
	23	By Sundries —— page——2 ——	—	10	12	---
Sept.	3	By Sundries —————— 3 ——	—	49	08	02
	16	By Sundries —————— 4 ——	—	4	07	06
	36	By Sundries —————— 5 ——	—	13	13	03
Octob	31	By Sundries —————— 6 ——	—	168	10	08
			—	262	13	05
		By Bal. value of Remains ——	4	354	16	67
			—	617	0	—
1723		Payments, or *Caſh*-Creditor.				
Aug.	31	By Sundries *per* Book—1 ——	—	30	—	—
Setp.	30	By Sund.——page——1 ——	—	15	—	—
Octo.	31	By Sund.——page——2 ——	—	62	—	---
			—	107	—	01
		By Balance, reſts in *Caſh* ——	4	297	07	--
			—	404	07	10

		Poſting-Book 2.		*l.*	*s.*	*d.*
1723		Expences, *&c.* Debtor.				
Oct.	3	To Paym. hereon ſince 1 *Aug.*	1	32		
1723		*George Mattock*, Debtor.				
Aug.	1	To Stock, now owing me —	1	20	—	—
1723		*Germain Bazin*, Debtor.				
Aug.	1	To Stock, now due to me —	1	10	—	—
1723		*Thomas Roberts*, Debtor.				
Aug.	23	To Payment, to him —	1	20	—	—
Sept.	28	To ditto —	1	10		
Oct.	25	To ditto —	1	10		
			—	40		
		To Bal. now due to him —	4	20		
			—	60		
1723		*John Field*, Debtor.				
Aug.	31	To Payment, to him —	1	10		
Sept.	23	To ditto —	1	5		
Oct.	28	To ditto —	1	20		
			—	35		
		To Bal. now owing him —	4	15		
			—	50	—	—

Poſting-

Poſting-Book 2.

				l.	s.	d.
1723		Expences, *&c.* Creditor.				
Octob	31	By *P.* and *L.* carried there —	4	32	—	—
1723		*George Mattock*, Creditor.				
Sept.	15	By Receipt, of him —	1	10	—	—
Octob	31	By Bal. now owing me —	4	10	—	—
				20	—	—
1723		*Germain Bazin*, Creditor.				
Sept.	20	By Receipt, of him —	1	5	—	—
Octob	31	By Balance, now owing me —	4	5	—	—
				10	—	—
1723		*Thomas Roberts*, Creditor.				
Aug.	1	By Stock, now owing him —	1	60	—	—
1723		*John Field*, - - Creditor.				
Aug.		By Stock, now due to him —	1	50	—	—

Poſting-Book 3.

				l.	s.	d.
1723		*Richard Hunt*, Debtor.				
Aug.	1	To Merchand. ſold him	1	6	05	01
	10	To ditto	1	0	07	06
	17	To ditto, a Parcel	1	5	18	04
Sept.	6	To ditto, 2 Maſs. Pearl	1	0	05	—
	11	To ditto, 14 Ells Clo. at 2*s.* 6*d.*	1	1	12	06
				14	08	05
1723		*Anthony Coccart*, Debtor.				
Auſt.	5	To Merch. ſold him	1	6	16	06
	20	To ditto, a parcel	1	1	04	—
Sept.	15	To ditto, a parcel	1	0	16	—
				8	16	06
1723		*John Graves* and Comp. Debt.				
Aug.	5	To Merch. a parcel	1	3	10	09
Sept.	30	To ditto, a parcel	1	10	15	03
				13	17	—
1723		*Thomas Woodman*, Debtor.				
	17	To Merch. a parcel	1	8	13	—
	2	To ditto, a parcel	1	4	17	04
	29	To ditto, a parcel	1	37	16	06
				51	06	10

Poſting-

Poſting-Book 3.

				l.	*s.*	*d.*
1723		*Richard Hunt*, Creditor.				
Aug.	8	By Receipt, of him	1	4	—	—
Sept.	11	By ditto	1	8	15	11
			—	12	15	1
1723		By Bal. now owing me	4	1	12	6
			—	14	08	05
1723		*Anthony Coccart*, Creditor.				
Aug.	12	By Receipt, of him	1	3	16	06
Sept.	11	By ditto	1	3	—	—
Octob	11	By ditto	1	2	—	—
			—		16	06
1723		*John Graves* and Cp. Creditor.				
Aug.	16	By Receipt, of them	1	1	10	06
Sept.	30	By ditto	1	2	—	03
Octob	31	By ditto	1	5	15	03
			—	8	17	—
		By Bal. now owing me	4	5	—	—
			—	13	17	—
1723		*Thomas Woodman*, Creditor.				
Aug.	30	By Receipt, of him	1	4	13	—
Octob	31	By Balance, now owing me	4	46	13	10
			—	51	06	10

		Poſting-Book 4.		*l.*	*s.*	*d.*
1723		*Henry Taft*, Debtor.				
Aug.	23	To Merch. a parcel ——	1	0	15	—
Setp.	3	To ditto, a parcel ——	1	0	12	—
	16	To ditto, a parcel ——	1	1	14	—
			—	3	01	—
1723		*John Bird* - - Debtor.				
Sept.	30	To Merch. a parcel ——	1	2	18	—
1723		Profit and Loſs - - Debtor.				
Octo.	31	To Expences, *&c.* brought here	2	32	---	—
	—	To Stock, gain'd ſince 1ſt *Aug.*-	1	65	10	—
			—	97	10	—
1723		Balance - - - - Debtor.				
Octo.	31	To Merch. now remaining ——	1	354	16	07
	—	To Receipts, or *Caſh* reſting ——	1	297	07	01
	---	To *Geor. Mattock*, now owing —	2	10	—	—
	---	To *Germain Baxin*, ditto ——	2	5	—	—
	---	To *Richard Hunt*, ditto ——	3	1	12	06
	---	To *John Graves* and Com. ditto	3	5	—	—
	---	To *Thomas Woodman*, ditto ——	3	46	13	10
			---	720	10	—

		Poſting-Book 4.		*l.*	*s.*	*d.*
1723		*Henry Taft*, Creditor.				
Aug.	30	By Receipt of him	1	0	15	—
Sept.	24	By ditto in full	1	2	06	—
			---	3	01	
1723		*John Bird* - - - Creditor.				
Octo.	20	By Receipt in full	1	2	18	—
1723		Profit and Loſs - - Creditor.				
Octo.	31	By Merch to cloſe that Accou.	1	97	10	—
1723		Balance - - - Creditor.				
Octo.	31	By *Tho. Roberts*, I owe him	2	20	---	—
	---	By *John Field* - - - ditto	2	15	---	—
			---	35	---	—
		By Stock, for its Neat	1	685	---	—
			---	720	---	—

INSTRUCTIONS.

Queſt. HAving taught me how to *State*, *Poſt*, and *Balance* my Books; What Method muſt I uſe at the *going out* of theſe Books *into* others?

Anſw. From the *Balance* of theſe Books, (See Poſting-Book, *Fol.* 4.) you muſt draw out another *Inventory*, as follows:

The INVENTORY.

London, October 31, 1723.

I Have in *Merchandize* of ſundry Sorts, to the Value of		*l.* 354 : 16 : 07
In *Caſh*, or *Ready Money*		*l.* 297 : 07 : 01
Owing to me, by		
George Mattock		*l.* 10 : 00 : 00
Germain Bazin		*l.* 5 : 00 : 00
Richard Hunt		*l.* 1 : 12 : 06
John Graves and Comp.		*l.* 5 : 00 : 00
Thomas Woodman		*l.* 46 : 13 : 10
		l. 720 : 10 : 00
Owing by me, to		
Thomas Roberts	*l.* 20 : 00 : 00	
John Field	*l.* 15 : 00 : 00	
		l. 35 : 00 : 00
My Net Stock		*l.* 685 : 10 : 00

And Poſt it into your *New-Poſting-Book*, as by the *Directions* given for the Poſting your other *Inventory*.

Q. In the *Caſh-Book* on *Debtor ſide*, (for Inſtance, in the Month of *Auguſt*) are Figures juſt before the *Money-Lines*, as 1 before 180 *l.* and 3 before 4 *l.* &c. I deſire to know what thoſe Figures ſhew?

A. The Figure 1 (before 180 *l.* in the firſt Line) ſhews the *Folio* of the *Poſting-Book*, on which the Accompt of *Stock* ſtands.

The Figure 3 following *Richard Hunt*, in the next Line, ſhews the *Folio* of the *Poſting-Book* whereon the Accompt of *Richard Hunt* ſtands.

The like is to be underſtood of the Figure 3 following *Anthony Coccart*: The 3 following *John Graves* and Company. The 3 following *Thomas Woodman*; And the 4 following *Henry Taft*, on *Debtor ſide* of ſaid *Caſh-Book* for the Month of *Auguſt*, and of thoſe on *Debtor-ſide*, of the ſaid Book for the Months of *September* and *October*.

Q. What do the Figures (on the *Creditor-ſide* of ſaid *Caſh Book*) which come juſt before the *Money Lines* ſhew? For Inſtance, in the Month of *Auguſt* on *Creditors ſide*, of the Figure 2 following *Thomas Roberts*, juſt before the 20 *l.* and the 2 following *John Field*, juſt before the 10 *l.*

A. The Figure 2 following *Thomas Roberts*, ſhews that his Accompt ſtands in *Poſting Book*, Fol. 2. And the 2 following *John Field*, ſhews, that his Accompt ſtands alſo in ſaid Book, Folio 2.

The like is to be underſtood of the Figures 2. 2. on *Creditor-ſide* of the *Caſh-Book* for *September*.

And of the Figures 2. 2. 2. on *Creditor-ſide* of the *Caſh-Book* for *October*.

Q. What does the Sum *l.* 57 : 03 : 10, at the *Foot* of the *Debtor-ſide* of the *Caſh-Book* for the Month of *Auguſt*, ſhew?

A. It ſhews the *Total Sum received* during the Month of *Auguſt*, and is produced by ſubtracting the 180 *l.* in the firſt Line, from the *l.* 237 : 03 : 10 on the *Debtor* of that Accompt.

The like is to be underſtood of the *l.* 69 : 14 : 08 at the *Foot* of *September*, and of the *l.* 97 : 08 : 07 at the *Foot* of *October*.

And as thoſe *Sums* ſhew the *Total Receipt* during each *Month*, ſo the *Sums* 30 *l.* on *Credit-ſide* of the *Caſh-Book* for *Auguſt*, the *Sum* 15 *l.* for *September*, and the *Sum* 62 *l.* for *October*, ſhew the *Total-Payment* during each of thoſe *Months*.

Q. How is the *Balance* (or *Reſt* of *Money*) in *Caſh*, found?

A. You muſt ſubtract the 30 *l.* (on *Credit* of *Auguſt*'s *Caſh-Book*) from the *l.* 237 : 03 : 10 on the *Debit-ſide*, and the Remainder being *l.* 207 : 03 : 10 in the *Balance* or *Reſt* of Money, in *Caſh*, which *placed* under the 30 *l. paid*, and *added* to it, makes a juſt *Balance* with the *Debtor ſide*. See the *Caſh-Book* for the Month of *Auguſt*.

You are to do in the like manner to find the *Balance*, or *Reſts* of *Caſh* for the Months of *September* and *October*. See the *Caſh-Book* for both thoſe Months.

Q. What does the Figure 3 againſt *Richard Hunt*, (in the *Day-Book*) and the 3 againſt *Anthony Cocoart*, and the other Figures in the *Margin* of the *Day-Book*, ſhew?

A. They ſhew the *Folio's* (of the *Poſting-Book*) whereon the Accompts of *Richard Hunt*, *Anthony Cocoart*, and the other Accompts ſtand.

And alſo ſhew that thoſe *Perſons* or *Accompts* are *Debtors*; as the Figure 1 under the ſmall *Line* of the *Margin*, and at the *Foot* of each Page of the *Day-Book*, juſt againſt the Words *Merchandize Sold* ſhews that the *Accompt* of *Merchandize* ſtands in *Poſting-Book*, on *Fol.* 1. and is *Creditor*.

Q. What do the Figures (in the *Poſting-Book*) coming juſt before the *Money Lines* on *Debtor-ſide*, ſhew?

A. As the Words of each Line on *Debtor-ſide* of ſaid *Poſting-Book*, immediately following the Word *To* ſhews what *Accompts or Perſons* are to be *Credited*, or *Counterparted*, ſo thoſe Figures ſhew on what *Folio's* in the *Poſting-Book* thoſe *Accompts*, or *Perſons* are to be found.

Q. What do the Figures coming juſt before the *Money Lines* and *Creditor ſide* of the *Poſting-Book* ſhew?

A. As the Words in each Line on *Creditors-ſide* of ſaid *Poſting-Book*, immediately following the Word *By*, ſhews what *Accompts*, or *Perſons* are to be *Debited* or *Counterparted*; ſo thoſe *Figures* ſhew on what *Folio's* in the *Poſting-Book* thoſe *Accompts* or *Perſons* are to be found.

Q. How muſt I Enter the *Goods* that I *Buy*.

A. You muſt enter them in a *Bought-Book*; as for Inſtance.

Merchandize Debtor to Perſons.
Bought,
Of (ſuppoſe) *John Thompſon*, *viz.*

46 Ells Linen, at 3 *s.* *per* Ell ——— ———	*l.* 6 : 18 : 00	
52 Ells, ditto, at 4 *s.* *per* Ell ——— ———	*l.* 10 : 08 : 00	
	—————————	*l.* 17 : 06 : 00

This Article (and others of a like Nature) muſt be poſted in your *Poſting-Book*, to the *Credit* of the Accompt of the Perſon of whom Bought. Here *John Thompſon*, and the *Total of each Page* of your *Bought-Book*, muſt be poſted in ſaid *Poſting-Book* to the *Debit* of Accompt of *Merchandize*.

Q. I have been told, that a good Method of *Book-Keeping* will ſhew to the Owner of the Books, or thers concerned, theſe following *neceſſary* (and many other) Particulars, *viz.*

Concern-

Concerning Merchandize.

N°. 1. What *Goods* (during the whole, or any Time of the Accompt) have been *Bought*, brought into Charge, when, of whom, and at what Prizes.

2. What *Goods* (as above) have been *ſold*, iſſued out of the Charge, when, to whom, and at what Prizes.

3. The whole Quantity *Bought* and *Sold*, and the *Profit*, or *Loſs*, ariſing on thoſe ſo diſpoſed of.

Concerning Caſh *or* Money.

4. What Sums of *Money* have been *Received* (as above) when, of whom, and on whoſe Accompt; alſo whether in part or in full.

5. What Sums of *Money* have been *Paid* (as above) when, to whom, and on whoſe Accompt. Alſo whether in part or in full.

6. What Sum Total has been *Received* and *Pai* (during the whole, or during any Time as above, and conſequently the Sum *Reſting* in *Caſh*.

Concerning Perſons *with whom I deal*.

7. For what Sums *they ſtand indebted*, from wha Dates, and for what.

8. For what Sums *I ſtand indebted* to them, fro what Dates, and for what.

9. Whether any *Ballance*, or *Remainder*, be du *from them* to me, or *from me* to them, and what Sum.

Concerning my Expences.

10. What *Expence* I have been at (during the Tim of the Accompt, or any part of it) and ſuch *Expen* conſider'd and allow'd, then what *Neat Gain*, or *Lo* has attended.

67

Concerning my Stock.

11. What *Stock* I *began* with, and what my *preſent Stock* is, and what Particulars compos'd each.

Now I deſire you to ſhew me how this Method will anſwer all theſe Particulars?

A. Concerning Merchandize, Your *Bought-Book*, will ſhew you the particular Demands of *Num.* 1.

And your *Day-Book*, thoſe in *Numb.* 2.

The *Debtor-ſide* of Accompt of *Merchandize* in your *Poſting-Book*, will ſhew the whole Quantity bought, and its *Creditor-ſide*, the whole Quantity ſold, and the ſame Accompt ſhews you alſo the *Profit* and *Loſs* ariſing on thoſe you have diſpoſed of: (See the Accompt of *Merchandize* in *Poſting-Book*, Fol. 1.) Thus the Demands *Numb.* 3. are ſhewn.

Concerning Caſh, or *Money*, The *Debtor-ſide* of your *Caſh-Book* anſwers the Demands in *Numb.* 4. and the *Creditor-ſide* of the ſaid Books ſhews the Demands in *Numb.* 5. and conſequently thoſe in *Numb.* 6 by comparing the *Debtor* and *Creditor-ſides.*

The *Creditor-ſide* alſo of the ſaid Book ſhews the *Balance* (or *Reſt* that ſhould be found) in *Caſh*.

Concerning Perſons with whom you deal. The *Debtor-ſides* of their Accompts ſhew the Demands of *Numb.* 7. and the *Creditor-ſides* thoſe of *Numb.* 8.

And conſequently their Accompts compared in *Debtor* and *Creditor*, ſhews the Demands of *Numb.* 9.

Concerning your Expences. The Accompt of *Expences* in your *Poſting-Book* ſhews the *Expences*, as in *Numb.* 10. and the Accompt of *Profit* and *Loſs*, will ſhew the *Neat-Gain* or *Loſs*.

Concerning your Stock. The Accompt of *Stock* in your *Poſting-Book* ſhews that you began with, and the Accompt of *Balance* ſhews your *preſent Stock*, and of what Particular it conſiſts, and anſwers the Demands in *Numb.* 11.

FINIS.

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